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TIC DOULOUREUX, WITH SPECIAL REFERENCE TO TREATMENT BY ALCOHOL INJECTIONS.*

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History: Trigeminal Neuralgia (Tic Douloureux) was first described 800 years ago by Avicenna. Various subsequent descriptions indicate that it was early recognized as a distinct entity though often confused with other forms of facial neuralgia. There is, perhaps, no disease which shows so little variation in its manifestations in different individuals; even the various patients' descriptions of the pain are apt to have a striking similarity. Its chief characteristics are the severity of the pain and the paroxysmal nature of it, the paroxysm lasting from a few seconds to several minutes.

Age: Most of the cases begin after thirty. Patrick mentions one case beginning at the age of seven years. In Sir Victor Horsley's cases, the youngest was twenty-one years of age. I have seen two cases between the ages of twenty and thirty years. One of these is a man of twenty-five, who had pain entirely confined to the lingual nerve. Once established, the disease usually lasts the remainder of the victim's life, often with remissions of months or even years.

Heredity: I have never observed any factor of heredity. Most observers say the same.[1] Dana mentions one case in which the father had the affection, one in which the mother had it, and one in which the grandmother had suffered in a similar way. No heredity predisposition even seems to be present.[2] Head states:

*Read before the Section in Laryngology and Rhinology, New York Academy of Medicine, Dec. 18, 1918.

"These patients are in no sense neurotic nor have they neurotic heredity." Nor is there any evidence of transmission of a gouty tendency; in fact, so far, no factor of causation has proved to be inherited.

Sex: The sexes seem to be affected about equally. Dana records its occurrence more frequently in women. Head, quoting from his own and the large experience of Sir Victor Horsley, states: "The distribution is about equal in the two sexes." In my own experience there has been a slight preponderance of cases among men, in the proportion of fourteen to ten."

Environment: This also is a negative factor. While the diesase is rare, it seems to be no respecter of climate or nationality; neither do social or individual conditions of living seem to play any part. The majority of patients are among the poor, but many have become so after the onset of the disease. Mental workers as well as laborers may be victims. The statesman, Bismarck, is said to have suffered from it the last twelve years of his life.

Habits: For the most part, the patients are people with good habits. I have not seen it in any individual whose constitution was broken down by bad living. Many of the patients take alcohol freely, but this is usually a habit acquired after the onset of the disease. The fact that so few of them become addicted to opiates rather seems to argue that they are usually people of strong character. Worries aggravate the condition, but cannot be said to have any more than a predisposing influence.

Pathology: Dr. John Fothergill, in 1773, described Tic Douloureux as a sharp, corrosive, cancerous acrimony. This little bit of bombast is not much more meaningless than many of the subsequent attempted scientific explanations of the morbid factor. Sluder,[3] Snow,[4] Roe,[5] Berens[6] and others have described sinus disease, especially sphenoiditis, as the cause. Operative treatment in their cases has relieved the condition, but Roe reports a relapse in one of his cases after seven months. Many dentists have found disorders of the teeth and consider this the primary cause of the disease. Shields[7] considers it is due to dentinal tumors and pulp nodules; certainly, some cases seem to subside after teeth extraction, but as most of them have this done very early and yet the pain returns, it does not seem logical to consider it the sole factor in the etiology.

Pain resembling tic douloureux may appear at the onset of meningitis due to the irritation of the nerve trunks in their intracranial course. I have examined the nasal accessory sinuses in all cases,

but cannot say that I have ever found sinus disease to be a constant factor. The same can be said of other peripheral sources of irritation, although at the onset before the true character of the pain has been established, such foci may appear to be the cause of the phenomena. The reflex pains due to visceral disturbance have been confused with tic and it would be impossible to say that it may not be of that nature. How much reflex irritation could operate to produce periodic spasms of pain over a long period, would be hard to explain.

The lightning pains of locomotor ataxia bear some analogy to Tic, but syphilis has rarely been found in these cases. A toxic irritant in the blood seems a last resort and, of course, explains very little. Several cases I have noticed had marked hyperacidity, but as mastication is usually a terror to the patients, it could be explained on that ground. One of my patients, however, seemed to be able to keep himself fairly comfortable by taking large doses of milk of magnesia.

There seems to be no record of a post-mortem on any case which might throw some light upon the obscure cause of this disease. Microscopic findings and examinations of the Gasserian ganglion and nerve trunks removed by operation have shown nothing abnormal. I have several times found in dissecting rooms, necrosis of the walls of the sphenoid sinus with thickened dura over the intracranial course of the second and third divisions of the trigeminal nerve. Such a lesion one might consider would cause severe pain in the distribution of those nerves, but in the absence of clinical data, I have never been able to correlate the phenomena. It would seem more probable also that it would produce steady rather than paroxysmal pain.

Diagnosis: Once the disease has been established, it is easily recognized. The face on the side affected is held motionless; no form of expression is attempted. The walk of the patient and all movements are regulated to prevent any unnecessary jar which might induce a spasm. The slightest touch, even a draught of air, may start it, and attempts at talking or drinking are interrupted by the sudden seizure. In most of cases the facial muscles on the affected side are contracted with the onset of the spasm. This muscular spasm is not a true tic, but is the same phenomena as occurs about a broken bone or injured joint, and is merely nature overdoing the effort, to immobilize the part. Lacrimation and flushing of the face of the affected side are quite common, but not by any means constant. The spasm, after lasting from a few seconds

to a few minutes, passes off only to be followed by another in a varying interval of seconds, minutes or hours. The duration is sometimes merely a momentary stab. It is never a steady pain. Patrick[8] states: "Any pain lasting over one-half hour is not tic douloureux."

In the early stages, the pain is not quite so characteristic. In these cases it may be confounded with migraine, or pain from a peripheral focus, such as caries of teeth, sinus disease or disorder of refraction.

A case under observation for a short time will, however, soon differentiate itself from any of these conditions. A truly established form might be mistaken for the early stage of an intracranial lesion, such as tumor, abscess or beginning meningitis; but a short period of observation would soon show the different course of these conditions.

Branch of Nerve Involved: The pain may affect all three divisions at once; more often either one or two branches is involved. It nearly always begins in one branch, spreading to others as the disease advances. In case of single involvement, the second seems to be most commonly affected. Where more than one is affected, it is usually the second and third; the first and second may also bear the brunt of the attack, but never the first and third together. In three of my cases, all three divisions were involved, while in one, the location of the pain was in the lingual alone.

Treatment—Drugs: I have never found any drug that would afford relief for any length of time. In the case mentioned above, milk of magnesia did seem to give the patient some respite. Dana[9] believes that in the first or even second year of the disease, large doses of strychnine will effect a cure, this being the result in eleven out of fifteen cases in his own series. In the later stages, all are agreed that no drug exercises much influence; even opiates seem to have very little control of the spasm. Gelsemium and butyl chloral have both been used with slight success. Leszynsky[10] says that in the early stages, castor oil three times a day will effect a cure. I have found two cases benefited by this and would advise trying it in all cases.

Electricity: The use of a constant current is mentioned by Head and others as efficacious sometimes, the anode placed over the area of pain distribution and the kathode over the spine.

Counter Irritation: This undoubtedly gives relief in some instances; either the actual cautery or some form of application applied to the sensitive areas. Ethel chloride spray will

sometimes give temporary relief. Possibly the apparent influence of operative procedures on the nose and the extraction of teeth can be attributed to their effect as counter irritants.

Operative Treatment—Nerve Section: The second and third divisions have been cut and a period of remission of several months has resulted. The second division has been cut at the infraorbital foramen and even at the foramen rotundum, the latter being quite a formidable operation and not now practiced. Likewise, the third division has been cut at the mental foramen and at the foramen ovale. The latter is difficult and not advisable in any case.

One of the first records of nerve section for this disease is that of Dr. J. C. Warren of Boston, who divided the facial nerve to secure immobility of the face. The patient had relief for some time, but relapsed. The nerve section method has been largely abandoned since the introduction of the alcohol injection treatment. The latter can accomplish quite as much and is simpler. The same may be said of treatment by avulsion of the nerve. While this is quite an old method, it still has its advocates, but it has been generally given up in favor of the alcohol injection method.

The major operation of removing the Gasserian ganglion (Gasserectomy) has yielded brilliant results, the cure being permanent in nearly all cases. It was first performed by Horsley and MacEwen in 1892. In 1893, Hartley and Krause described the method of removing the Gasserian ganglion almost exactly similar in detail, which was subsequently known as the "Hartley-Krause Method." A little later, a different method was described and practiced by Dr. Harvey Cushing.[11] This method necessitates cutting the zygoma, entering the cranial cavity lower down through the sphenoid and squamous portion of the temporal bone. The middle meningeal can be more easily controlled by this route. It is now considered the safest method. In the hands of experienced men, the mortality is almost nil. Slight modifications of the ganglion operation have been practiced. Abbe[12] divided the nerves intracranially and inserted rubber tissue between them. Frazier[13] divided the sensory route of the ganglion. The results of the removal of the ganglion have been a total and permanent relief from pain. The evidence that some still have pain is not conclusive according to Cushing. The probable explanation of any recurrence is that the ganglion was not completely removed. Keen confesses with the most commendable candor that there was no ganglion tissue in what he removed in his first two cases.

The operation is a formidable one and should only be attempted by surgeons of special experience, but it may be said that any operation, however severe, that can bring relief to the sad victims of tic douloureux cannot be considered other than one of the triumphs of surgery.

Alcohol Injections: This, what might be called the newest method of treatment, has seemed destined to supplant all others in all cases which have gone beyond the initial stage. The introduction of the method must be accredited to Schlöesser, who first began it in 1903. Various experiments had led up to its practical application. Bartholow injected chloroform into a nerve in 1874; Eulenburge treated cases of brachial neuritis and sciatica in 1884 by the injection of chloroform. Shapiro in 1885 experimented with osmic acid, one percent in glycerine. Bennett in 1889 used osmic acid, 1 and 2 percent, by exposing the nerve and injecting it. Frankels' experiments on animals showed that osmic acid caused marked nerve degeneration. Later, it was found by Vaillard, that alcohol acted in the same way. Schlöesser tried it on tic cases and found that they had immediate relief. His technique was acquired by his students, but the details of it were first published by Ostwalt[14] in 1906. About the same time, Levy[15] and Baudoin of Paris published the description of a different technique devised by them, with satisfactory results of treatment. Patrick[16] and Hecht of Chicago first described the Levy and Baudoin method in this country with case reports in the same journal. Killiani of New York first reported the Schlöesser method at the Academy of Medicine, December 29, 1906. These methods differ considerably. The Schlöesser treatment consisted for the most part of peripheral injections into the nerves at their bony access, namely,—infraorbital canal, mental foramen, and superorbital notch. If these were not successful, deeper injections were performed for the second and third divisions by an intraoral route. The Levy and Baudoin method injects the second and third division at the foramen rotundum and foramen ovale by inserting the needle through the cheek. They also inject the first division through the orbit. The latter method is the one generally adopted by operators of the present day for second and third divisions.

A few years later, a bolder pioneer, Hartel of Bier's Clinic, injected the Gasserian ganglion by a route passing through the foramen ovale. This was described and practiced in the United States by Julius Grienker[17] of Chicago and H. H. Martin[18] of Savannah. Dr. Martin's report on ganglion injection contains the most valuable

data so far published. A slightly different route was practiced for injection of the ganglion by Wilfred Harris[19] of London, about the same time. His report on his experience with alcohol injections of the nerve trunks is one of the best published.

This procedure should only be tried on extreme cases with all three divisions involved, and is a last resort after foramen injections have failed. It would certainly be justifiable to give it a trial before resorting to gasserectomy.

The results recorded by the various operators with alcoholic injections are almost uniformly successful as far as temporary relief goes. A remission from three months to a year or even three years is the usual consequence. Killiani[20] reports 100 percent of successful cases, accepting temporary relief as the standard of success. Patrick and Harris, who have had the largest experience, do not claim quite as much.

From the review of the literature, it would seem that considerable discrepancy in results are obtained and this is due to the fact that many consider placing alcohol around the nerve or in proximity to it, as constituting an alcohol injection. Levy advises penetration of the nerve if possible, but many others consider proximity all that can be attained. Most of them use 1 to 2 c.c. of alcohol 80 to 90 percent, and repeat the injection until relief is obtained.

Personal Observations: During the last four years, I have had experience with 24 cases and out of this number can report 14 successful injections, including one injection in the Gasserian ganglion. In my earlier cases, I was content to put the alcohol as near the nerve as possible. Most of these had temporary relief. I then began to consider the possibility of getting within the nerve sheath in all cases, and while I have not been able to do this in every instance, in those where I have succeeded, the results have been far better and in some of them, there is a prospect of permanent relief.

Technique: A special needle, three inches long, one millimeter in diameter, with its end abruptly bevelled and containing a small stylet, is inserted until the nerve is touched. It is then pushed forward a slight degree till one may judge that it is buried within the substance of the nerve. The stylet is now withdrawn and a hypodermic syringe attached. Through this, four or five drops of 2 percent cocaine is injected and the stylet replaced, still holding the needle steadily in situ. This should produce an immediate anesthesia. If this is obtained, I withdraw the stylet and inject 8 or 10 minims of 85 percent alcohol. This causes no pain and the anesthesia becomes more complete. The patient tells you when you

touch the nerve and usually refers the severe pain to the distribution of the nerve. When the cocaine is injected, he experiences a feeling of numbness and swelling and, on testing, it is found the area of distribution is anesthetic. Unless I get this immediate anesthesia from the cocaine, I do not inject the alcohol, but try to strike the nerve by an alteration of the direction of the needle. I never try more than three or four times to do this at one attempt; but later, next day probably, have another trial. If one desires to obtain this end, namely, to put the alcohol within the sheath of the nerve, they may have to make several trials.

The patient should lie down with a low pillow under the head so as to have the plane of the side of the face as near the horizontal as possible. No anesthetic is necessary, the skin alone being cocainized.

The land marks adopted for the second division are practically those of Levy and Baudoin, namely,—insert the needle just below the angle formed by the zygomatic process with the malar bone. From this point, the needle is inserted slightly upward and a trifle backward through the pterygo-maxillary fissure to the foramen rotundum. The land mark of entrance for the third division, which I have preferred, is on a level with the lower part of the incisura notch, and three-fourths of an inch in front of the tragus. From this point insert the needle with an inclination upward to the foramen ovale.

The depth of the foramen rotundum varies and measurements will only deceive one. I find it helpful to have another needle the same length as the one I am going to use. By holding this needle parallel to the course the needle will take in the proposed injection, placing one end of it at the junction of the nasal process of the superior maxilla with the frontal bone, and measuring from there the point on the needle where the vertical plane of the cheek would intersect it, gives me the necessary depth of insertion.

The foramen ovale lies about one-fourth to half an inch nearer the surface.

The approach to the ganglion by the Härtel method is as follows: Insert the needle opposite the second molar tooth of the upper jaw, in a direction upward and inward. I have found an approximate guide for the inclination upward to be the top of the auricle. I have been guided in the inclination inward by bony surfaces encountered by the needle.

Harris injects the ganglion by lodging the needle in the third division at the foramen ovale by the usual route and slowly inject-

ing the alcohol till it infiltrates the ganglion. The only objection to this method is the possibility of entering the carotid artery, if the needle is pressed in too far. This is not so likely to occur by the Härtel method.

Directions and details of land marks are superfluous, as they vary greatly in individuals. One can only learn this part of the work by practice on cadavers. In the course of time, he will find that the point of the needle will transmit to him the necessary information to guide him in his approach to the various foramina. A cadaver may be easily prepared by dividing the head vertically and dissecting out the nerves from the inside. The experimenter may then practice inserting the needle and verify his success or failure by inspection.

Results and Conclusions: Of the fourteen cases recorded as successful in my series, ten have been free from pain ever since. Stated more definitely, one has been free four years; two, three years; one, two years; one, one and a half years; two, one year; one, nine months; one, six months; one, one month. Four cases have had relapses. One case was re-injected successfully at once; one had returned in another division of the fifth nerve and had that successfully injected; one has had slight warnings, but no return of severe pain; one has had severe paroxysms and intends to have another injection.

Untoward Results: Slight hematoma after injecting the second division is common, but is soon absorbed. Paralysis of the sixth nerve occurred in one case, but disappeared in a few weeks. My ganglion case developed a severe keratitis six weeks after injection. This recovered in three months, leaving some opacity of the cornea. Such an accident need not occur if patients will keep themselves under periodic observation of an oculist the first three or four months. The same thing is liable to occur after gasserectomy and is preventable by either covering the eye with a shield or closing the eyelids with adhesive plaster for a time at the onset of the trouble.

Cushing does not consider this a trophic disturbance, but merely due to the loss of the protective reflex from the anesthesia.

Killiani[21] reports trismus of the masseter muscle occurring after injection of the third division. This is probably due to the large amount of alcohol which he used, as I have never observed it. A facial paralysis has been reported from ganglion injection by both Harris and Ball. In both cases the trouble quickly disappeared.

The logical conclusion from a review of all methods and treat-

ments would seem to be that in all cases medical treatment should first be tried. Not much result can be expected from it except in the early stages.

Cases should all be examined by a competent dentist and rhinologist, and any peripheral focus should be treated at once. If such measures fail, alcohol injection at the foramen rotundum and foramen ovale should first be tried, even in cases with all three divisions involved. This may control the paroxysms for a considerable period of time and even permanently in some cases. If the first division still remains intractable, after trying injection at the supraorbital notch, which will not likely accomplish anything, injection of the ganglion itself should be tried. This seems to insure a permanence of cure greater than the injection of the branches.

In the event of failure of all previous methods, the gasserectomy will be the final resort.

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ANCHYLOSIS OF THE CRICOARYTENOID ARTICULATION WITH THE REPORT OF A CASE PRESENTING INVOLVEMENT OF BOTH JOINTS AND REQUIRING TRACHEOTOMY.

Dr. Thomas J. Harris, New York.

Anchylosis of the cricoarytenoid joint is a more common affection than is generally supposed. In its acute form it is undoubtedly often overlooked and in the chronic form, when only one side of the larynx is involved, without question is often mistaken for recurrent nerve paralysis.

The literature of the subject is extensive. Excellent articles have been written by Semon, Morell-MacKenzie, Casselberry in the Handbook of Medical Sciences, Watson Williams and Bryson Delavan, in a paper read before the N. Y. Academy of Medicine in 1903.

Bilateral cricoarytenoid anchylosis is, however, a far rarer occurrence and one which, if the cords are fixed in the median line, fraught with grave consequences to the life of the patient. A case of this character it has recently been our privilege to see. The history of it is as follows:

Mrs. S., age 54 is the mother of seventeen children, ten of whom are living. There is no history of any previous illness. The patient is a rosy cheeked, stout woman with a short, full neck. The onset of her trouble took place some eight or nine months previous to the time that she was first seen by us. Her only symptom at that time was hoarseness. Later and very gradually she began to have some difficulty in breathing. This increased to such an extent that she was compelled to seek medical aid. Examination of the throat at this time showed the left vocal cord motionless and in the median line. The arytenoid cartilages and the aryteno-epiglottic fold on both sides appeared distinctly swollen, more on the left; the false cords were also swollen; the normal appearance of the cords was lost; the right vocal cord also showed impaired movement. The appearance of cords, false cords and arytenoids on both sides was practically alike. There seemed to be in addition a subglottic tumefaction. The patient, while having some difficulty in breathing, suffered chiefly in this respect upon exertion. A

luetic condition was suspected. On account of the possibilities of an acute oedema the patient was advised to come into the hospital for a tracheotomy. A high tracheotomy under local anaesthesia was performed a day later giving immediate relief to the breathing.

A careful study of the case was then instituted in the endeavor to discover, if possible, the cause of the trouble. Examination of the blood and of the spinal fluid gave a negative Wassermann; x-ray of the chest showed no neoplasm or aneurism. Careful study of the patient's mental condition permitted the exclusion of any central lesion. X-rays of the teeth showed a dental abscess; extraction of the diseased tooth followed. At this time the patient was complaining of a distinct acute arthritis involving the knee joints which soon subsided.

Careful questoning of the husband revealed a probable history of lues dating back to early manhood. No examination of his blood was made. After the reaction following the tracheotomy had subsided it was determined to attempt gradual dilatation by means of specially constructed intubation tubes. This was first done by myself and later by my associate, Captain Henry H. Forbes, into whose service the patient originally came and who kindly transferred the case to me on account of his departure to France. Both attempts, one carried out by the direct method and the other by the Dwyer method failed. It was impossible to introduce even the smallest tube. Later a further attempt was made with the tube spatula of Lynah but also without success. All procedures were done with the greatest gentleness and without any wounding of the tissues. All further attempts in this direction were abandoned. The removal of one or both cords was taken under careful consideration as well as dilatation from below; both procedures were decided against in view of the laryngoscopic picture which had now showed itself. In addition to the fixed rigidity in the median line of the left vocal cord, virtually all movement of the right vocal cord had ceased and both cords were seen lying in the median line with only a narrow slit between them. Whereas, at the time of the tracheotomy the patient could breathe without great discomfort through her larynx, now immediate suffocation followed any attempt to close off the tracheotomy wound. This change in the condition took place within the period of from four to eight weeks. In view of the possible specific history, the patient was given several injections of sal-

varsan and in the intervals one-tenth of a grain of cyanid of mercury hypodermically daily. At the time of this report, April 20, the condition of the larynx remains virtually unchanged, although the swelling of the false cords is now so great as to completely obstruct the true cords. The patient is in good health and otherwise seems to be well.

Comment: We are unable today to speak positively as to the cause of the anchylosis in this case. It would seem to rest between some focus of suppuration, probably the teeth, and lues. As regards lues it is difficult to explain how a gumma could involve both sides of the larynx and in spite of an energetic antisyphilitic treatment increase in extent without breaking down. We have not made any attempt to look through the recent literature for similar cases. As just stated, however, bilateral fixation is a rare occurence. Delavan, in the article just referred to, in a series of six cases reports one case of bilateral fixation which followed typhoid fever. Apart from the progressive nature of the lesion in our case it is characterized by the serious consequences of the position in which the cords became fixed. If, as in other cases, the fixation were in the cadaveric position, or, as rarely occurs, in extreme abduction, it is evident that, apart from loss of voice, no peril to the patient's life would exist.

Etiology: Syphilis, tuberculosis and cancer all are common causes in producing fixation of the joint. Cricoarytenoid anchylosis can be acute or chronic, false or true. It undoubtedly occurs frequently as an acute affection in the course of the various fevers, especially typhoid fever. Here the inflammation can either promptly resolve after a short interval without unpleasant consequences or can go on to actual suppuration of the joint with loss of tissue and permanent fixation. More common than even the fevers as a cause is probably what has often been spoken of as cold and rheumatism or gout but what really is an unrecognized infection such as we referred to in our case proceeding from some focal center such as the accessory sinuses, the ear, and more commonly, the tonsil or the teeth. Even gonorrhoea occasionally is a cause. Trauma both external and internal may give rise to fixation of the joint and in long continued paralysis of the larynx, fixation of the joint is apt to take place.

The *differential diagnosis* is of great importance. A definite determination in favor of fixation as compared with recurrent nerve paralysis is often not easy and indeed often cannot be

made until after repeated examinations. In favor of paralysis is the unchanged appearance of the cords and of the arytenoid cartilages. In anchylosis a tumefaction of the joint can usually easily be made out. As regards true or false anchylosis, if there is some movement of the cord it is in favor of the false variety. The *prognosis* in acute fixation of the cricoarytenoid joint so far as the recovery of motion is concerned, depends upon the ability to promptly remove the cause. In the cases dependent on so-called cold, which are really of an infective origin, prompt removal of the cause should be followed by immediate subsidence of the anchylosis. When the condition, however, has become chronic the outlook is not encouraging. With the joint fixed by the deposit of new tissue the probabilities are that it will remain so permanently. If only one joint is involved, even if the voice is permanently affected, no further discomfort need ensue. When both sides are involved, however, there can be, as in the case just reported, very grave consequences.

As illustrative of the question of prognosis reference may be made to the cases of Delavan. His first case was one of acute laryngitis which followed an acute pharyngitis and tonsilitis. Here, in a short time, the condition of the larynx was completely restored to normal. The second case was the result of phlegmonous pharyngitis occurring a number of years before and so permanent. The third case was one following diphtheria; in this case there was difficulty in vocalization and aphonia at times; obstructed breathing took place at the times of severe colds; only one cord was involved. The fourth case also followed diphtheria and the fixation was permanent. His fifth case was one of unilateral anchylosis following typhoid. Here the movement of both arytenoids was restricted at the onset, but motion returned in a short time on one side. The sixth case was one of bilateral fixation following typhoid fever and requiring a tracheotomy. The history states that during the day he is able to breathe with the tube plugged but when asleep suffers from dyspnea. The cords are in a position resembling abductor paralysis.

Treatment: All acute cases of fixation of the cricoarytenoid joint should be treated with great care. Soothing inhalations and complete rest of voice are indicated. In the light of our present knowledge, persistent and careful search for the producing cause and its removal when found as speedily as possible

is demanded. The treatment of the chronic condition depends upon the amount of inflammation present. Unilateral fixation in the cadaver position without dyspnea can profitably be left alone. If, however, as a result of bilateral fixation or involvement of one joint, dyspnea is present, it is in order to consider means for dilatation. This is best done with the graduated Owyer tubes, modified by Rogers and Lynah. In rare instances removal of one or both cords may be indicated. A final word of caution is in order in regard to the desirability of not delaying where dyspnea is present but performing an immediate tracheotomy.

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TWO NEW INSTRUMENTS FOR REAMING THE UPPER END OF THE EUSTACHIAN TUBE IN THE RADICAL MASTOID OPERATION.

Dr. Alfred Kahn, New York.

One of the great disappointments following the radical mastoid operation is that although the operation may have been neatly done and the result excellent, still there is often discharge into the middle ear cavity from the throat and Eustachian tube. This is notably the case when this type of patient has contracted an acute cold. He will return with the statement that the ear discharges off and on. Of course, these facts are understood by every radical operator. It is realized that numerous attempts have been made to occlude the Eustachian tube at the time of the radical mastoid operation, but these attempts have been more or less unsuccessful. Having this in mind, I have invented two instruments which, for want of a better name, I shall designate a mouse-nosed Eustachian curette and burr. The description of these instruments is as follows:

The Curette.—As per illustration, Fig. I, the curette end of this instrument consists of quite a long spoon tapering to a point. The sides of the spoon must be very sharp and fine-cutting. The spoon is tipped at its apex by a probe-like nose. This nose does not extend out from the spoon, but gradually tapers into the spoon. The object of this will be apparent as we proceed. The spoon tapers into a comparatively long handle. The handle is round and roughened, so that the curette can be easily manipulated between

the thumb and first finger, thereby giving the operator quite a delicate touch, thus enabling the instrument to be directed accurately. The beaded nose on the tip of the curette is put there as a feeler, acting in much the same way as a delicate probe, and also to keep the instrument from piercing any soft parts such as blood vessels, as might be the case if the instrument were tapered to a sharp point.

The Burr.—The burr is long, narrow and tapering, similar to the curette, so that it can easily enter the Eustachian opening. It is also tipped similar to the curette and with the same object in mind.

FIG. 1.

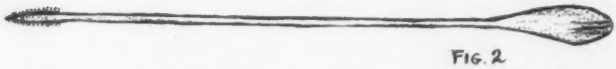

FIG. 2

The burr is roughened, and can enter the Eustachian tube much deeper and with more safety than any curette. The burr can also be used with more pressure than can be applied to the curette.

Technique.—First, the usual radical mastoid is done. The middle ear is carefully cleaned out; the Eustachian opening is located; the curette is inserted into the Eustachian opening with slight pressure, carefully feeling the way; it is then slowly turned round and round until the tube is reamed out. Of course, this must be done very carefully. The burr is then inserted in much the same way and the tube is deeper reamed and smoothed out.

50 East 42nd Street.

Idiopathic Dilation of the Esophagus. F. HARBITZ, *Norsk Mag. for Laegevidenskaben,* August, 1918.

The author describes the clinical and autopsy findings in three cases all of which seemed to be the result of some congenital abnormality, possibly a tendency to functional atony of the walls with abnormal conditions in the vagus nerving causing spasmodic contraction. The author classes idiopathic dilatation of the esophagus with Hirschprung's disease and hypertrophy of the pylorus in infants. The three patients whose cases are reported were men of 34, 40, and 27 years, respectively, and they had been having noticeable dilatation of the esophagus for eight, four and seven years.

ED.

VESTIBULAR REACTIONS IN CENTRAL NERVOUS DISEASES. REPORT OF THREE CASES.

Dr. George H. Willicutt, San Francisco.

The fields of work of the otologist and neurologist are today becoming more and more intermingled with the result that the neurologist frequently calls upon the otologist for assistance in the diagnosis of various intracranial conditions and the otologist reciprocates, or should do so, by asking the neurologist's help in complicated or puzzling internal ear cases. Since the work done on the labyrinth during the last few years shows the close relationship between this organ and the nervous system as a whole, it is easy to understand how labyrinthine symptoms developing in certain diseases of the nervous system send the patient to the otologist rather than the nerve specialist.

Either deafness of sudden onset or a diminished hearing of rather rapid progression, sometimes associated with head noises, tinnitus, vertigo or headache, often bring the patient into the otologist's hands for relief, whereas other symptoms of the existing nervous disease have been entirely ignored by the patient or have been of no particular significance to him.

In this report, I desire to give the history and otological findings in three cases of nervous diseases that have come under my observation during the past five years, and also the neurologist's diagnosis.

Case 1. Mrs. L. S., age 30 years. Housewife. Seen on May 4, 1914. Past History—Negative: always enjoyed the best of health. One child 6 years old. Mother and father alive and well.

Present trouble began March 22, 1914, with a severe epistaxis. On March 23, the patient had an attack of vertigo for the first time. During this day she had 8 to 10 attacks in all, being aggravated by bending over and lasting from a few seconds to some minutes. On the evening of the same day she suddenly became deaf in the right ear, the left ear being unaffected. On the following day, vertigo developed to such a degree that the patient vomited several times and was confined to her bed all day. She found that the attacks were lessened by lying on the right side and that they

were more severe when the room was darkened. She had no pain in the ear at any time, but a marked tinnitus was present all that day. For about a month previous to the onset of the present trouble, the patient recalled that she had felt a weakness and tired feeling in both lower extremities and had also had occasional severe headaches, especially in both temporal regions.

Otoscopic examination showed both ear drums and canals normal. No perforations, scars, nor evidence of previous ear disease. Both Eustachean tubes were patent.

Hearing Tests—Right ear, complete deafness: left ear, normal to whispered and conversational voice. Weber lateralized to the left ear. Rinne Test—left ear, positive: right ear, undetermined as the tones lateralized to the left ear. Bone conduction—left ear, slightly shortened: right ear, greatly shortened lateralizing to the left ear.

Vestibular Reactions. Spontaneous nystagmus—looking straight ahead, none: looking to right, rotary nystagmus to the right; looking to the left, rotary nystagmus to the left: looking up *or* down produced a vertical nystagmus *upwards*.

Equilibrium—No disturbances of equilibrium present.

Spontaneous Pointing Tests—Both hands normal.

Turning Tests—Turning to the right 10 times, produced horizontal nystagmus to the left of 33 seconds duration, but *no* vertigo. Turning to the left 10 times, produced a horizontal nystagmus to the right for 35 seconds and *no* vertigo.

Caloric Tests—Cold Water (10 C.) typical reaction on both sides after 2 minutes.

Otological diagnosis—Retrolabyrinthine lesion.

The patient was referred to the neurological clinic for further examination and the following report returned on May 6, 1914—"Wassermann negative: very slight intention tremor of both hands: speech somewhat slow but not scanning in character: slight tactile anaesthesia in lower extremities but no ataxia present: increased knee-jerks: Babinski present: ankle-clonus present: spontaneous nystagmus when looking to left and right: no *definite* eye lesion present but suspicion of beginning optic atrophy: no abdominal reflexes present. Diagnosis—Early Multiple Sclerosis."

Case 2. Miss M. S., age 21 years. Seen May 13, 1914. Past history—No children's diseases. In the autumn of 1913, patient experienced occasional cramps in the stomach, especially after eating,

and lasting some hours. These attacks were very irregular, occurring two or three times a week. At the same time she had pains in both temporal regions. Upon moving the head or walking during these attacks, she had more or less dizziness. Has never had any ear disease.

Present trouble—Patient now complains of "headache over the ears" and frequent attacks of vertigo while sitting still or lying quietly in bed, being most troublesome just after retiring at night. Since April, 1914, she has noticed failing sight and double pictures when looking to the *left*. Has also had continual headache since this time which also becomes more severe at night. No disturbance of hearing complained of.

Otoscopic examination showed normal drums, canals and tubes on both sides. Nose negative.

Hearing Tests—Normal hearing in both ears for whispered and conversational voice. Weber in the head. Rinne Test—positive for both ears. Bone conduction—*greatly shortened* on both sides, to a greater degree on the right than on the left. Perception of high tones was somewhat diminished. Perception of low tones was normal.

Vestibular Reactions. Spontaneous nystagmus—looking straight ahead, none; looking to right and left showed a horizontal nystagmus to the right and left respectively (right eye does not go to inner angle when looking to the left): looking up produced a typical upward nystagmus: looking down produced a typical downward nystagmus.

Equilibrium—No Romberg. No disturbance when walking with open or closed eyes.

Spontaneous Pointing Test—Normal both hands, no pointing error.

Turning Tests—Turning to the right 10 times produced a horizontal nystagmus to the left for 40 seconds and profound vertigo and vomiting. Turning to the left 10 times produced a horizontal nystagmus to the right for 24 seconds and some vertigo, but markedly less than the previous reaction.

Caloric Test—Right ear, cold water (10 C.) typical reaction and pointing error after 16 seconds. Left ear, typical reaction after 18 seconds.

The patient was referred to the neurologist and the following report submitted May 16, 1914—"Wassermann negative: left eye

corneal and conjunctival reflexes gone: right eye, paresis of the internal rectus: hyperaesthesia of left half of face, body and left upper extremity: reflexes increased: ankle-clonus on right side: no Oppenheim, Babinski, nor Romberg present: no ataxia but slight weakness and rigidity of the lower extremities: very slight intention tremor of hands, more marked on the left side. Diagnosis—Multiple Sclerosis, early type. Prognosis good."

These two cases are interesting examples of a disease of the nervous system which may come to the otologist first and unless, after a careful examination by the otologist, the case is referred to the neurologist, the correct diagnosis of the case may be missed and some useless treatment carried on. With the development of more of the cardinal symptoms of the existing disease at some later date and the diagnosis made by the clinician called in as a result, more or less embarrassment may be felt by the otologist at this time.

The next and last case is a comparatively rare one, but as it is occasionally seen by the ear specialist, I desire to call it to your attention again.

Case 3. Mr. J. L., age 24 years; occupation, waiter. Seen on August 10, 1914. Past History—Had an operation on his back some eight years ago but cannot give any definite history of same. Thinks it was "to straighten his back, which had always been bent to the left." Has had cold hands and feet for some time (5 or 6 years) and occasionally has pains in his shoulders and arms.

Present trouble—For past four weeks has had greatly diminished hearing in both ears which came on suddenly with a great roaring "like a waterfall" within a half hour's time. Had always had good hearing before this and had never had any ear trouble. Had severe dizziness during this attack and has had repeated attacks since. Everything turns to the left during these attacks and he has to sit down wherever he is to keep from falling. Seven weeks ago he fell out of a chair during one of the attacks and fractured his right arm below the elbow. Also complains of double vision when looking to the left.

Otoscopic examination showed normal drums on both sides.

Hearing Tests—Right ear, can hear only a shout at concha: left ear, conversational voice at 30 cm., whisper at concha. Rinne Test—right ear, questionable as the tones were referred to the other ear: left ear, positive although the air conduction was greatly shortened. Bone conduction—right ear, nil (referred to the other ear): left ear, markedly shortened. Low tones

gone on right side, greatly shortened on the left. High tones gone on the right, somewhat short on the left.

Vestibular Reactions. Spontaneous nystagmus—on looking to the right a marked horizontal nystagmus was noticed: on looking straight ahead, to the left, up or down, no nystagmus was produced.

Equilibrium—No disturbances of equilibrium were present.

Spontaneous Pointing Tests—left hand normal: right hand not determined on account of fracture of forearm and cast.

Turning Tests—Turning to the right 10 times produced only 4 or 5 strokes to the left and no vertigo: turning to the left 10 times produced horizontal nystagmus to the right for 25 seconds and moderate vertigo.

Caloric Tests—left ear, cold water (10 C.) a very slight reaction after 4 minutes, the pointing error *absent:* right ear, typical reaction after 45 seconds, normal pointing error.

Otological diagnosis—Neuritis of the eighth nerves. On the right side, the cochlear branch being involved the most: on the left side, the vestibular branch.

The neurological examination made on August 14, 1914, follows —"No history of lues. Wassermann negative. Slight paraesthesia of both hands. Partial anaesthesia of left hand and forearm and right hand to temperature and pain. Marked scoliosis of the vertebral column in the dorso-lumbar region. Pupils react to light and distance very slowly. No Babinski, no Romberg. Reflexes normal. Diagnosis—Syringomyelia (latent type).

In closing, I desire to emphasize the fact that the otologist must not forget that the subjective symptoms, impaired hearing, head noises, tinnitis, and headache are not always indicative of primary ear lesions, and in a great many cases, the neurological examination of the patient will disclose interesting and important facts regarding the prognosis and proper treatment of such cases.

516 Sutter Street.

The seventh annual meeting of the Pacific Coast Oto-Ophthalmological Society will be held in San Francisco August 4th, 5th and 6th, 1919. An exceptionally good program is promised.

Communications should be addressed to Dr. A. S. Green, Secretary, 210 Post St., San Francisco, Cal.

VINCENT'S ANGINA.

Dr. Hugo A. Kiefer, Los Angeles, Calif.

The term "Vincent's angina," originally applied to an inflammatory condition of the throat, more especially of the tonsils, has now become a misnomer as our knowledge of the disease and its causes has extended.

It is supposedly a specific process attacking the tonsils, pillars, pharynx, larynx, trachea, mouth, palate, uvula, and, as will be seen later, many other parts, and is characterized by the formation of vesicles, membranes, ulcers and even gangrenous areas at times. No age is exempt, though it is found most frequently in children and in young adults of either sex. It is said to be quite common among nurses. It usually runs an acute course, though chronic cases are by no means rare.

Vincent gave its frequency as 2% of all anginas, but later investigations show these figures to be incorrect, at least under certain conditions. Various synonyms have found their way into literature, among them being "diphtheroid angina," "ulcerative angina and stomatitis," "epidemic ulcero-membranous stomatitis," "ulcerous angina," "trench mouth," "trench throat," "ulcero-membranous angina" and "spirocheten-bacillen angina."

History. Vincent, whose name has been applied to the affection, first described the fusiform bacillus and the spirillum under discussion, and its connection with ulcerative anginas, in 1896. Plaut immediately preceded him with a description of the same organism in 1894; and he in turn was preceded by Rauchfus in 1893 with his description of both the germs. Even as far remote as 1879, F. Y. Clark described a fusiform bacillus, which very likely was identical with that of Vincent. Emil Mayer of New York reported a case of Vincent's angina in 1902, which was probably the first case to find its way into print in the United States.

This shows that either the disorder was not commonly recognized when it occurred, or that it has been greatly on the increase since that time.

The very rapid increase of the disease in Europe since the outbreak of the World War undoubtedly accounts for the more frequent observation of cases in this country during very recent times. Rolleston says that Vincent's angina constituted 7 per cent of all cases of sore throat in the Grove Hospital, London, in 1913. Captain Bouty gives 2 per cent to 3 per cent as the proportion of all throat complaints in the French army during peace times, and

*Read before the American Oto-Laryngological Society, February, 1918.

recently in a British military hospital in France, he says, the proportion shows 23 per cent.

Etiology and Bacteriology. The disease is unquestionably transmissible by direct contact, as in kissing, and by the use in common of such articles as drinking glasses, cups, spoons, forks, handkerchiefs, towels, etc.

The spirochetes love filth and squalor, and those who are in a depraved physical condition are very prone to its attacks. Pyorrhoea, dental caries, mercurial stomatitis, tonsillitis, tonsillectomy, diphtheria, measles, scarlet fever, pertussis, syphilis and other debilitating conditions pave the way for the infection.

Vincent's spirillum and the fusiform bacillus are the organisms that cause Vincent's angina, and the two germs are nearly always found together. Likewise, they are usually associated with other pathologic organisms, such as the streptococci, pneumococci and staphylococci.

Vincent's spirochete is a thin spiral from 8 to 20 microns in length, and 2 to 4 microns in width, having about the same thickness throughout its length; the convolutions number from 2 to 10 or 12. It is motile under favorable conditions of temperature and of culture.

The fusiform bacillus is a rod-shaped organism from 4 to 12 microns in length, and 1 to 6 microns in width. Its ends are pointed, the body straight or curved, and in some instances it has been reported to be flagellate. Motility has also been observed under certain conditions. The spirillum has been said never to be found unassociated with the fusiform bacillus, though some cases have been reported of the fusiform bacillus being present without the spirochete. Both organisms are preferential, but not obligate anaerobic, and flourish on the surface of ulcers, as well as in the depths. When near the surface they are nearly always associated with other disease-producing germs, but when occurring deep in the tissues they are usually found alone. Both spirochete and bacillus are frequently present in other diseases of the mouth and throat, such as pyorrhoea and dental caries, tonsillitis, diphtheria, syphilis, stomatitis, scarlet fever and streptococcic infection, whether symptoms of Vincent's angina be present concomitantly or not; and it has often been found in these parts when there was no demonstrable disease present. They have also been demonstrated in inflammation

of the middle ear and of the external auditory canal, in suppuration of the accessory nasal sinuses, gangrene of the lung, buboes, cerebrospinal fluid, cerebral abscess, and in meningitis. The lymph current rather than the blood seems to be the distributing agent.

Little is known about the incubation period, but judging from the time it takes to develop cultures, the period is probably one of considerable length. Cultures of both these organisms are rather difficult to make, as both are anaerobic, and take some time to develop,—about five days to a week. Loeffler's blood serum is probably as favorable a medium as any.

Inoculation experiments have not proven successful, and the failure to satisfy the postulates of specificity has raised the question whether they are pathogenic per se or not. This fact, associated with the other conditions of (1) these germs being nearly always associated with other disease producing germs in the presence of Vincent's angina, and (2) their being present in a large proportion of other mouth and throat diseases, such as mentioned, without producing any symptoms of Vincent's angina, seem to make it doubtful that the spirochete and the bacillus can be condemned as disease producing factors. And yet when we obtain clear smears or cultures of these bodies from vesicles, free from other germs, it seems impossible to regard them as otherwise than pathologic germs.

Both organisms stain quite readily with a variety of reagents, carbol-fuchsin and anilin getian violet, and methylene blue being among the best. They are both gram negative.

Pathology. The disease was classified by Vincent himself as occurring in two forms, the diphtheroid and the ulcero-membranous. It is doubtful if this can be considered an entirely rational classification, as we find vesicular, lacunar, membranous and ulcerative forms occurring either alone or in combination. The vesicular probably escapes observation more frequently than the other forms, whether the vesicles appear alone or in combination, because the vesicles are small and often difficult of discovery. In the vesicular form there are small vesicles from the size of a pin-point to an ordinary pin-head on the gums and pharynx, which contain the mixed organisms, more especially the spirochetes. The gums may be swollen and bleed easily. The lacunar form invades the tonsil crypts and appears as small, white or grayish patches in the mouths of the crypts, easily detachable, and not usually bleeding when detached. The membranous form attacks usually the tonsils, but may extend to the pillars, uvula and pharynx, and even the larynx and trachea. The membrane is grayish or yellowish, quite adherent,

and apt to leave a bleeding surface when detached, and in some cases exuding quite a fetid odor. It is easily mistaken for a diphtheritic membrane. The ulcerative form has always presented itself in my experience as a superficial ulcer resembling in all respects a mucous patch, or as a deep ulcer resembling a broken-down syphilitic ulcer of the tonsil, with necrotic tissue, and maybe broken-down membrane. The superficial form has usually been found on the anterior pillar at the point of frequent contact with the tongue.

Symptmatology. The onset is usually sudden, often with a slight, brief chill, sometimes with a marked chill lasting several hours. Other cases present such a gradual onset that they cannot determine when their illness actually commenced. Fever runs from 99° to 103°, more generally not above 100.5°, although one case, I believe, has been reported as high as 108°. The highest fever usually occurs during the first day or two. The constitutional disability presents just as great a diversity as does the temperature, varying from a negligible malaise to a very great prostration, apparently out of accord with the degree of objective disturbance. Severe continual headache and distressing wakefulness sometimes accompany the disorder. Nervous excitement and irritability of temper are very marked in some cases. Enlargement and tenderness of the sub-maxillary and cervical glands is common, but suppuration is rare. Distressing pains and soreness on motion may occur in all the muscles of the body. Gastro-intestinal disturbances are occasionally present. The disease usually runs an acute course from five or six days to two weeks; sometimes it runs into a chronic condition lasting several months; while at others it shows a tendency to recurrence of acute courses. Death does not occur often, and when it does form a sequel it is usually the result of toxemia and exhaustion.

Complications. The complications of Vincent's angina are so numerous and diversified, even though unusual, that it becomes again apparent that the term angina expresses but poorly the character of the disease. Indeed the complications, when they do occur, are generally to be regarded as more serious than the angina itself.

Among such complications are destruction of the tonsils, palate and pharynx by deep necrosis; necrosis of the jaw; noma; conjunctivitis; inflammation of the salivary glands, sub-maxillary and parotid; inflammation of the external auditory canal, suppuration

of the middle ear, and mastoiditis and brain abscess; nephritis with albuminuria, urethritis and even balanitis and inflammation of the prepuce; pneumonia, necrosis of the lung and pleurisy; endocarditis and myocarditis; neuritis, though paralysis is said never to follow; rheumatism; erythema and herpes of the skin.

Diagnosis. The diagnosis of Vincent's angina can seldom be depended on except with the aid of the microscope. One reason is that the lesions, vesicles, membranes and ulcers resemble so closely the same lesions occurring in other diseases that frequently they cannot be differentiated objectively. We have but to consider that pseudo-membranes may be caused by the fusiform bacillus and spirillum, the Klebs-Loeffler bacillus, the streptococcus, the staphylococcus, the pneumococcus and other forms, to see how confusion may arise, since there is not sufficient difference in the appearance and other characteristics of such membranes to distinguish them without knowing what organism is present. Besides, Vincent's bacteria are seldom unaccompanied by other organisms.

Vincent's angina bears such a close resemblance to diphtheria, lacunar and membranous tonsillitis, stomatitis, ulcerative carcinoma, and to different manifestations of syphilis that one is aided but little by the objective appearance of the lesions and must depend upon the history of the case, its course, and the microscopic findings. When associated with any of these diseases, as it not infrequently is, the diagnosis simply becomes a little more confusing.

Treatment. Much diversity of opinion exists as to the best method of treatment. So numerous are the remedies advocated, so ardent are the supporters of different remedies, and so uncompromising are others in condemnation of some of these highly extolled remedies that it becomes at once evident that the experiences of various observers have been quite diversified, and that there is no such thing as one satisfactory method of treatment that will meet the exigencies of all cases.

Among the treatments most commonly recommended, I quote the following from various authors:

(1) Cleanse the parts with peroxide solution and follow with a solution of chlorate of potassium; give ten grains of potassium iodide three times daily internally.

(2) Dissolve two teaspoonfuls of sodium perborate in a large glass of water and gargle frequently.

(3) Swab with a solution of liquor potassii arsenitis three or four times daily.

(4) Paint the affected parts with a 2 per cent chromic acid solution once daily.

(5) Apply the silver nitrate stick locally.

(6) Bichloride of mercury 1-500 locally.

(7) Trikresol 5 per cent in alcohol should be freely applied to the ulcer and the same in .5 per cent solution as a mouth wash; and formalin in the form of lysoform, either pure or diluted, used in the same way.

(8) Saturate a swab of glycerine, dip it in salvarsan powder, and apply to the affected areas. Salvarsan can also be used in the form of an insufflated powder, or as a slightly acid or alkaline solution applied locally. Salvarsan locally is more efficient than by intravenous injection. Tincture iodine and methylene blue are quite efficient in most cases.

Cautery and excision of necrosed areas is usually condemned.

The author of this paper has had quite good results in his limited experience from the daily application of a 3 per cent chloride of zinc solution swabbed on the affected parts once daily, together with a mouth-wash and gargle and nasal douche or chlorate of potassium solution 5 to 10 grains to the ounce every to or three hours, and potassium iodide 5 to 10 grains three times daily internally. Supporting treatment of iron, arsenic, quinine and strychnine are usually given in combination with the above.

Prognosis. The prognosis, generally speaking, is good; but it should be guarded in cases where there is deep ulceration or necrosis; where the membrane extends into the larynx and trachea, and where there is a markedly strong accompanying infection of streptococci, pneumococci or staphylococci, and when it occurs as a secondary infection. The ordinary uncomplicated cases run a course of five or six days to two or three weeks. Severe cases may run much longer, and end in a chronic condition. Recurrences are often noted.

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PAROSMIA.

Dr. William H. Dudley, Los Angeles, Calif.

This condition may be described as a more or less persistent appreciation of some abnormal odor by one individual which cannot be discovered by another. Great variations in these perceptions may exist. It may be that a single odor, or several, may all be perceived as some other, usually more or less offensive, odor, while all other odors may appear normal. Or, some odor may be persistent to the exclusion of all others.

Inasmuch as by the greater number of the cases reported, the patient's complaint is of a disagreeable smell, the older name, *kakosmia,* meaning a bad smell, seems the more appropriate, at least to this class of cases. It is a well known fact that any physical disturbance of any of the nerves of special sense does not result in pain, as does a like disturbance of a nerve of ordinary sensation, but instead, a perversion of the usual function, and this of a disagreeable nature; e. g., we are in the habit of explaining the disturbing tinnitus as a disturbance of the terminal filaments of the auditory nerve; likewise the photopsia accompanying some of the diseases of the fundus of the eye as being caused by a disturbance of the retinal elements by secondary contractions of inflammatory products, etc. Again, when abnormal odors fasten themselves to our organ of smell, some disturbance to some portion of this apparatus must have taken place. In studying the cases observed, as well as those reported by others, it appears to the writer that so far as the cause is concerned, cases of parosmia may be divided into two general classes: the endogenous, in which the disturbance may be caused by some reflex from some inflammatory state of some neighboring organ, inflammation of the olfactory nerve itself, pressure on, or destruction of the olfactory nerve, or its cerebral center by pressure or traumatism, or, disturbance of nutrition of the nerve, as in arteriosclerosis. The exogenous form, as far as reports of cases go, does not appear to be of especially frequent occurrence, and when seen, appears to consist of some quite vigorous impression by a decidedly penetrating odor upon the olfactory nerve in an especially susceptible individual.

As a case representing the reflex form, from an inflammation of a neighboring organ, I would refer to a case of Dr. C. A. Robertson of New York in 1873, related in the *Boston Medical and Surgical Journal.* The patient, a woman of fifty years, one week after the operation for cataract, was taken with iridochoroiditis. The reporter states that early one morning she sent for him and on visiting her she complained that she was suffering from a most intolerably noisome stench. She seemed unable to find language strong enough to express her disgust for the foul odor that tortured her, but the anguish portrayed in her face supplemented the narration which her tongue inefficiently essayed. She said that an unpleasant smell commenced the previous evening and gradually grew stronger and stronger until now she could bear it no longer and live. She could compare it to no smell she had ever known before, for it was worse than all conceivable bad odors combined in one, she said. The doctor regarded it as a subjective sensation referable to a reflex excitation of the olfactory nerve; in other words, a neuralgia of the nerve of special sense, and undoubtedly aroused by irritation of the ciliary nerves consequent upon the inflammation. The reporter stated that a hypodermic of morphia put the patient to sleep, and when she awoke, the smell was gone.

A case caused by pressure was reported by Dr. H. C. Wood in the *Philadelphia Medical Times* in 1881, when a glioma of the frontal lobe, and olfactory bulbs, with hallucinations of the sense of smell, smelling always disagreeable odors. The man grew gradually worse and died.

Some early writer upon this subject must have stated that parosmia was a frequent symptom among the epileptic, the insane and the hysterical, for the statement is repeated in almost every article written upon the subject I have reviewed; but in conversation with those who have had extended experience among this class of mental defectives and unfortunates, I am informed that as an epileptic aura, it is occasionally, though far from frequently, seen, but among the insane and hysterical it is, except in cases of cerebral abscess or tumor of the anterior lobes, quite rare.

An interesting case representing the variety caused by nutritional disturbances was reported by Dr. Carl Munger in THE LARYNGOSCOPE, 1904. A man aged thirty, a generous liver, suffered from some headaches, had for some time become conscious that he was overpowered with a persistent odor of what he

described as heliotrope. The odor was delicious, but ever present. All liquors gave off this odor, particularly aromatic ones. Cocktails seemed to be permeated with this odor; the axillary secretions seemed particularly strong of heliotrope. The perfumes of passing women all seemed to be the heliotrope. Violet toilet water was heliotrope to him. Oranges, among fruits, seemed to be most strongly perfumed with heliotrope. His perception of offensive odors seemed to be normal. He could appreciate various odors met with in a barn among horses with as much acuteness as ever. His perversion of the sense of smell lasted for six months, and gradually diminished till the time of the record, when all that was left of the smell is the odor that emanated from the axillae, which continued to be heliotrope The reporter's diagnosis of the physical condition of the patient responsible for the parosmia, was general arterio-sclerosis, and the patient was ordered potassium iodide, which was followed by relief of the headaches as well as the parosmia.

The effect of cerebral tumors pressing on, or implicating the uncinate convolution was decsribed in a clinical lecture by Mr. H. Campbell Thompson, in Middlesex Hospital in 1907. He here relates a case, one of the annoying symptoms of which was an unpleasant smell. In this case the autopsy finding was a large abscess in the fore-part of the temporosphenoidal lobe, the cerebral center for olfaction.

The substitution of one odor for another, mostly am unpleasant one for an agreeable one, has not often been observed in the literature at command: however, Prosser James in the "Twentieth Century Practise of Medicine" states that now and then otherwise normal individuals find certain substances to give the odor of others; mignonette and violet, for instance, have been perceived as garlic, and other curious anomalies have been observed. He promises that these instances may have the relation to normal sense that color blindness does to normal vision; also that whatever the histological or pathological condition causing this vaguery in olfaction may be, to the present time it has been undiscovered.

During the first few years after the advent of epidemic influenza, a certain number of cases of parosmia were reported as complicating this disease: at least this is so stated by Dr. A. J. White in "Burnett's System of Diseases of the Ear, Nose and Throat" (1893). I am of the opinion that these cases were not especially numerous; at least, they were not in the locality of

my practise at the time, which was in the state of New York, and I do not recall reports of this condition from many others, though one can easily understand that inasmuch as this disease frequently affects somewhat seriously the upper air passages, that the olfactory apparatus might easily be included in its pathological range.

An illustration of the exogenous variety of parosmia may be instanced in the case of Mr. W., aged 31, unmarried, who presented himself for the relief of a terribly bad odor, always present, which he imagined could be perceived by others; which latter belief caused him fully as great distress as did his own disgusting perception. It may be stated that the patient had the appearance of a neurasthenic, and as the history developed, I felt sure that he was worse than that. The patient stated that the odor was of about six months' duration and had not improved by age; was worse on arising in the morning, was also worse in a warm room, and the room in which he worked he always kept well ventilated as a precaution against a too great disturbance of others. The trouble started following a night out, being royally entertained with sundry libations till he was not quite sure what he did do. He became conscious of the abiding presence of an exceedingly offensive smell, which, he stated had never left him during the following six months. Further inquiry of the patient revealed the fact that he was also in all probability a sexual pervert in whom a perversion of some other of his senses would not be strange. In fact it appears to the writer that an individual must be especially susceptible to unusual impressions to become a victim of this form of parosmia. In the examination of this patient, a careful investigation of the sinuses by transillumination and vacuum exhaustion was made, with careful search for anything like an abnormal odor of any kind, with only negative results. However, in the mind of the examiner, there was never any question as to the reality of the odor to the patient, at the same time, its unreality to anyone else.

After a review of the cases reported during the past fifty years or so, it seems to the writer that a patient, suffering from a well marked case of kakosmia, can be made about as miserable as it is possible to be, without the suffering of acute pain from nerves of common sensation.

512 Brockman Bldg.

A PLEA FOR THE EARLY TRAINING OF DEFECTIVE SPEECH.*

MARY SUMMERS STEEL, Philadelphia, Pa.

The normal child should have a vocabulary sufficient to enable him to make known his needs by means of spoken language by the time he has attained his third year, and attention should be given to correct articulation and voice during this developmental period. This course would eliminate "baby talk" and prevent many cases of defective speech. The precocious excitable child who associates with older people who talk rapidly should have careful training in distinct speech, as he usually tries to imitate the manner of his elders. Many cases of stammering are due to this effort to "keep up." Certainly the child who has marked difficulty in expressing his thoughts in language should have assistance in his efforts before he realizes his inability to make himself understood. The experience of those interested in the correction of defects of speech has been that such children are either neglected or receive too much attention, by being told to "speak correctly," that "you can do it if you want to" and yet receiving no help as to correct methods.

The majority of the cases in our clinic at the Philadelphia Polyclinic Hospital and College for Graduates in Medicine are sent to us from the schools where the pupils are handicapped in the work which is not ordered for individual needs; but the best time for the correction of the defects would be before the child is embarrassed by the inability to speak correctly. In the home life the child is sheltered, and members of the family learn to understand the imperfect attempts to put thoughts into language. In many cases if strangers come to the home the child who cannot be understood retires to the background and becomes absorbed in occupations which do not require speech.

These children turn to mechanical things and some of them can express thoughts with a pencil, drawing and painting being easier than speaking. They later become absorbed in silent reading and depend upon the visual comprehension of language. In this way the child learns to think faster than his peripheral mechanisms can produce the words. They do not grow out of the trouble, but rather into it. When the time comes for school they are not properly equipped for the struggle to keep pace with the fluent talkers,

*Read before the Philadelphia Laryngological Society.

and there is little attempt made by their teachers and associates to understand the articulation which deviates from the normal, or to be patient with the stammerer.

Good speech is the result of the co-ordination of the peripheral speech mechanisms—respiratory, phonatory and articulatory—with the central mechanism—mentalization, and each case of defective speech must be carefully studied to ascertain which of these mechanisms is not performing its functions.

At this time we shall not refer to the speech of the so-called feeble-minded patient, taking for granted the fairly good or in some cases above the average mentality, and consider the central mechanism from the standpoint of the acquired faculties. A child may have normal hearing for the sounds of speech, but if the peripheral mechanisms fail to co-ordinate in the spontaneous development of speech the subjective hearing is perverted and false kinesthetic memories and habits of speech result. These patients can be assisted to acquire normal speech by the re-education of these mental pictures, through the voluntary control of the peripheral mechanisms of speech. They can learn to build up with the elements of language, a new speech. This re-education requires systematic, careful and patient training on the part of the pupil and the teacher.

The best way to present this matter is to tell you of a few cases. A number of young men in other respects qualified to become officers in the service of our country have been rejected on account of defective speech, and I have seen one case of a young man who has been in France serving as an ambulance driver, who has always had a slight stammer, who is now having great difficulty with his speech. I have under observation a number of boys, between the ages of 8 and 14 years, whose parents thought they would grow out of stammering and are now confronted by the problem of removing the boys from school, thus making it necessary for them to fall behind in school work and in two instances having younger members of the family overtake them in the race; or of allowing them to struggle along under the nervous strain of being unable to recite freely and of being ashamed, on account of being different from their fellow students.

A word about the time to begin the speech training of the deaf child. B. G., 3 years of age, has probably been deaf since birth and has been treated by some of our best aurists. The mother felt that something could be done to start the speech training, although the other members of the family were opposed to such a procedure because they thought the child too young, but Dr. Henry Dinten-

fass referred them to me and today completes the second month of training. The child has learned to read upon the lips the names of thirty-four objects. When these objects are placed where she can see them she will read the name upon the lips of any one of three or four people and bring the object to the one who has asked for it. Twenty of these names she can speak with voice. She knows her own name, Beatrice, when spoken and when written by typewriter. She can name twelve letters of the alphabet by sounds, and responds to five commands, "jump," "walk," "up," "blow" and "put your head on the pillow." The child is robust and the mental effort is not taxing her, but is rather an outlet for her hitherto unused energy.

J. Z., 21 years of age, of good mentality but uneducated, who left school because his father thought he was "no good," as he could not talk well, said, "I wort tor de Tiladeltia Eletrit Tompany," meaning, I work for the Philadelphia Electric Company. He has learned to say a few sentences well, but he has been told so often that he is "no good" and his incorrect articulations are so firmly fixed in his mind that we have a task of larger proportions than if we had started the work even ten years ago.

A. T., 12 years, and T. H., 10 years, "happened" this evening to talk without stammering, and S. O., 18 years of age, illustrated the voluntary control stage of the training for stammering, using the co-ordinations which he has been studying and putting into practice. These boys should have had some help in their struggle for normal speech before they were exposed to failures in recitations in school and the jeers of their companions. Few persons with normal speech can understand or sympathize with the stammerer.

1700 Walnut St.

The Chemical Composition of Ragweed Pollen. J. H. Koessler, *Jour. Biological Chemistry,* September, 1918.

The results of the protein hydrolysis of the ether-alcohol-extracted pollen showed a relatively high amount of arginine and histidine nitrogen in the material. Probably these are present in protein combination in the original pollen. The results also indicated that probably all of the nitrogen in the alcohol-ether-extracted pollen is present in protein combination. Ed.

THE AURIST AND LIP-READING.

EMMA B. KESSLER, Omaha, Neb.

Through the efforts of the medical profession the condition of the deaf and hard of hearing has been greatly alleviated. Aside from rendering skilled professional service, doctors have done much to promote the general welfare of the deaf. Many are indebted to their aurists for information about lip-reading, by the help of which they have been restored to as nearly normal living as possible. Three months after the war began in Europe, Germany provided classes in lip-reading. We have the record that shortly after, three deafened soldiers, two lawyers and one teacher were enabled to follow their regular vocations through such instruction. Our own government has made provision for soldiers who become hard of hearing by enrolling competent teachers that may be available for this service when needed.

Unfortunately many patients never hear about lip-reading while taking treatments under a specialist. Of this number those who later on learn of the help to be derived from speech-reading not infrequently express regret and surprise that lip-reading had never been mentioned to them. They would gladly have followed any suggestion of the specialist, but information regarding this form of help was not proffered.

From among fifteen persons who are more or less deaf, and who have recently become enthusiastic lip-readers, three had heard of speech-reading through their aurists. How had the others obtained their information? One, a post-mistress, was told by the post-office inspector that lip-reading would help her. Another read a story about two deaf girls who communicated by lip-reading, and investigated. A third got her idea from the motion pictures and then made inquiries until she found an instructor. Newspaper advertisement was the chief factor in bringing the matter to the attention of the rest. Granted that lip-reading is something that can be legitimately advertised, it is nevertheless a pity that anyone should have to defer studying the art until he by chance sees a notice in a paper. Many people never read the advertisements, and dailies and popular magazines scarcely make any reference to lip-reading.

During the course of the past two years, as occasions presented, some eminent physicians were questioned why they had not unreservedly been recommending lip-reading. Their reasons may be summarized as follows:

1. We don't know much about it.
2. We know of no one who would be interested.
3. We have no call for it.
4. We know few totally deaf people.
5. We have hesitated because it makes people feel that they have no hope.
6. We would advise lip-reading if it would do the patients any good.

Lip-reading has not received as much publicity as many other humanitarian agencies, hence the general public, the hard of hearing themselves, and those who are best situated to give them counsel, are not always fully aware of its worth. Wherever the value of lip-reading is realized, it will be a matter of conscience to urge it on the hard of hearing, in order that they may be compensated through their eyes for what they have lost through their ears.

Many of the ills of deafness could be presented if lip-reading were prescribed to the *slightly deaf*, just as medicines are prescribed for certain ailments. A person may be hard of hearing and yet appear perfectly well, but he is in real distress because he is soul-sick. For this trouble lip-reading is the best known remedy. It serves the double purpose of establishing a medium of communication, and of bringing about a readjustment to a changed physical condition. It is indeed very desirable that the hard of hearing acquaint themselves with the underlying principles of lip-reading before their deafness becomes a source of embarrassment. From the viewpoint of their own convenience it is just as important that they begin studying lip-reading before they are seriously handicapped, as it is to consult an aurist before their condition is chronic. Few people cease seeking remedies even after it has been ascertained that medical help cannot restore the hearing. They spend time and money and hope on nostrums, which, if harmless, at least do no good, with the result that they finally assume the attitude that nothing is worth while. They can then hardly be persuaded to rouse themselves sufficiently to study lip-reading, or, if they do, their progress is less satisfactory than it would have been had they begun their study before they became discouraged.

The aurist is in a position to exercise much influence over the patient who comes to him for help and advice. If lip-reading is suggested while his mind is still hospitable to new ideas he is more willing to make an effort to acquire a substitute for hearing than he will be after a long period of partial or total deafness. Moreover, he values the specialist's advice more than that of any other person. Well-meaning relatives and friends would have less influence because they have so often created a tense situation administering emphatic suggestions about how to hear with unresponsive ears. Professional advice comes to the rescue.

The individual's attitude is hopeful when he realizes that he can again understand the quietly spoken word and thus reduce his handicap to a minimum. Even before he has made much progress in speech reading his attitude toward life is changed. After a short period of study he is able to understand those with whom he comes in daily contact, and this fact demonstrates that he will in time be able to understand others. His future no longer looms cheerless before him when he realizes that he is not doomed to be useless.

The scores of men and women whose hearing has become impaired and who have been made or kept happy by lip-reading bear testimony to the good it will do. A certain teacher's case is typical. She was entirely dependent on herself for a living, and had to give up her position on account of her hearing. Her deafness was incurable. She experienced great difficulty in persuading people to allow her even to wash and clean for them. Those who did give her a chance were doubtless convinced that deafness is not necessarily a bar to cleanliness, for they hired her again. She is now an excellent lip-reader and has secured congenial employment. She says that money could not pay for what lip-reading is worth to her.

With lip-reading to rely on deafness is neither an affliction nor a curse, even though it remains an inconvenience. It would therefore seem to be entirely within the province and responsibility of the aurist to explain the value of lip-reading to every patient whose hearing cannot be fully restored.

4 Fle-Les, 20th and Capital Aves.

ALAR COLLAPSE FOLLOWING SEPTAL ABSCESS IN AN INFANT.*

Dr. David N. Husik, Philadelphia, Pa.

Alar collapse following septal abscess in an infant is a rather rare condition. This is the first case of this kind that I have ever seen, and I thought the case interesting enough to bring before you tonight for your examination and especially for suggestions as to its future reconstruction.

The history of the case is as follows: L. B., born June 21, 1918, at the lying-in- Charity Hospital, and pronounced a perfect baby. Five days later she developed an acute coryza with an abundance of mucoid discharge and some blood; as far as the mother knows there was no history of injury. She was treated for this condition locally during her stay at the hospital, and was discharged, with instructions to its mother to call for her family physician to continue nasal treatment.

The mother treated the case herself for several weeks, using mostly home remedies for sweating. The discharge increased in thickness, nursing became more difficult, and she developed a gastro-intestinal condition. A neighboring physician was called in who treated the gastric condition, but paid no attention to the nasal discharge.

When seven weeks old the members of the family began to notice a change in the shape of the child's nose. It seemed to spread out and the anterior nares were closing in. This condition gradually became more noticeable, and she was then referred to the University of Pennsylvania Hospital for examination and treatment.

When I saw the child for the first time, she was nine weeks old and appeared emaciated; anterior occlusion almost complete, very little nasal discharge; mouth breathing, a bottle the child held in her mouth being only retained for a few seconds at a time. The tip of the nose was prominent, and there was a depression where the end of the nasal bones and soft parts meet. An internal examination was not made at this time, as there was not a speculum small enough.

A diagnosis of congenital lues was made, and we prescribed mercurial inunctions in 10 grain doses to be rubbed in nightly, and to report in a week. In the meantime a Wassermann taken on the child's mother came back negative. A week later the child's general

*Read before the Philadelphia Laryngological Society.

condition was worse, the skin very much inflamed and irritated, and the bowels very loose. We discontinued the inunctions, and advised gastric treatment, that the child be brought for observation every three or four days. Internal examination shows a large cartilaginous perforation, with small crusts around free edges. There was no tendency towards atrophic changes. A Wassermann on the child's father came back negative.

On subsequent visits, the bowels became normal, infant seemed more cheerful, was gaining in weight, and breathing was somewhat easier.

The gradual improvement in the child's general condition without any local or constitutional treatment, the gradual improvement in

breathing, the negative Wassermann in the parents, led us to believe this an innocent infection.

The most probable explanation for this present condition is that during the first few days of life while in a charity institution the child must have had a slight injury to her nose. Hæmotama developed, which was not properly diagnosed, and later turned into suppuration, absorption of cartilage and perforation.

The early pressure of the hæmotama and later the abscess against the alae, caused a paralysis of alar muscles, and finally when pressure was removed by spontaneous rupture, there was a consequent alar collapse.

1303 Locust St.

SOCIETY PROCEEDINGS.

THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Meeting of January 10, 1919,
Continued.

His physical examination showed a large perforation in the upper posterior quadrant of the drum, from which exuded a foul discharge. The posterior bony canal wall was partially down, and the canal showed evidence of an incomplete radical operation. At the time of this examination, I could not understand why it was that the operator had not finished the radical operation, and it was only at the time when I operated that I discovered a far forward sinus, which had been exposed at the time of the first operation. The operator at that time seems to have been inexperienced and to have hesitated going further, after having exposed this far forward sinus. The patient was not totally deaf in the diseased ear. A radical mastoid was recommended and the patient was admitted to the New York Eye and Ear Infirmary on April 9. At the time of this radical operation, much to my surprise, the necrosed area seemed to be along the floor of the middle ear and to involve the internal wall of the middle ear, especially in the region of the round window. A fistula could not be demonstrated. In my endeavor to remove all necrosis, I fear that at this point in the operation, as I now look back at it, I must have injured the internal wall of the middle ear in the region of the round window. I especially mention this on account of the relation it had with the subsequent symptoms and final outcome of this case. The patient progressed satisfactorily until, on April 11, two days after the operation, he complained of being dizzy and showed a nystagmus towards the healthy ear. The patient complained of dizziness for three or four days, until on April 14, six days after the operation, his temperature rose to 103.5°. From April 9 to April 14, his temperature fluctuated between normal and 100.5°. On April 15, the seventh day after the operation, his temperature rose to 106. Nystagmus stopped; the patient was totally deaf in the diseased ear; I mention the fact that the patient was totally deaf and his nystagmus halted, as a demonstration that we were here dealing with a dead labyrinth, and because of the fact that, according to the Vienna school, the fact of a dead labyrinth occurring in the course of a labyrinth disease associated with meningitis, is a prima facie ground for doing the labyrinth operation. The patient at this stage, April 15, became unconscious and presented very marked symptoms of meningitis. He had a stiff neck and showed Koenig's sign. He also had a high spinal fluid cell count. This is the case mentioned by Dr. Perkins at a recent session of the Academy of Medicine in his paper on the peculiarities of the spinal fluid in cases of this type. He stated at that time, and has since stated to me personally, that notwithstanding the fact that my patient recovered, having the symptoms of a true case of meningitis, following a labyrinthitis, with total destruction of the labyrinth, this labyrinthitis following the radical mastoid operation, I should have done the labyrinth operation. He could not account for this patient's recovery. After April 15, the patient's temperature gradually dropped; he regained consciousness, and except for the fact of facial paralysis, which followed the operation and which is now almost entirely cleared, the patient made an uneventful recovery and was discharged from the hospital April 30. His wound was dressed by me for several weeks after his discharge, and he now has a perfectly dry cavity and is in excellent shape. It have asked the patient to appear here tonight for your inspection.

I have given this case considerable thought, and I attribute his recovery to the fact that the diseased area involved the inner wall of the middle ear, that this was soft and necrotic, and that it was further accidentally injured at the time of the radical operation in my anxious endeavor to remove all necrosed bone; that it was through this passage, by way of the internal auditory meatus, that the labyrinth was destroyed and that meningitis took place. This wall afterwards broke down (at my subsequent dressings there was a discharge of a spinal fluid) and I was able to pass quite a large-sized probe down to the internal auditory meatus. I kept the cavity firmly packed up to almost the end of the last dressing. It is for this reason, if you will examine the patient, that the radical cavity granulated almost up to the surface, and that the radical cavity itself became entirely obliterated. With the experience of this case in mind, and with its evident recovery due to a direct drainage from the meninges through the internal auditory meatus, through the internal ear, middle ear, etc., through an accidentally artificially created opening, the possibilities of a new labyrinth operation have made themselves apparent.

Before actually outlining the operation a few preliminary remarks might be in order.

First the operation is intended as a radical measure, as a last resort in meningitis coming from infection through the labyrinth and infecting the meninges of the internal auditory meatus. It might be used as a last resort following the usual operation, for the relief of diseases of the labyrinth. These various labyrinth operations which I have in mind all bear very close relationship and have been variously outlined by other otologists, notably Jansen, Hinsberg, and in America, Richards. These operations are intended, as I understand it, for the relief of purulent diseases of the labyrinth, and not as a means of draining infection from any area involving the meninges. If they are intended for drawing away infection when it has once reached the brain covering, thereby causing a meningitis, to my mind they are notably deficient. In fact, as I look at it, meningitis is very often due directly to the labyrinth operations here referred to. The technique of these operations is well known, I am sure, to all of you; but referring to them in a general way the substance of these operations consists in draining the labyrinth by opening up the various semicircular canals and then by taking away a part of the inner wall of the middle ear down to and covering the first turn of the cochlear, thereby draining the labyrinth. These operations are very often done after actual development of the meningitis. To my mind, they have little effect in relieving the meningitis, and their sphere of usefulness should absolutely be limited and demarcated as operations for infections involving the labyrinth and the labyrinth only. The advocates of this type of labyrinth operation all emphasize the fact that the operation must be done with extreme attention to detail, and that great caution must be used in removing the various layers of bone, so that the modiolus will not be injured and thereby cause a flow of cerebrospinal fluid, opening a passage directly to the brain. I repeat again, and strongly repeat, that the forms of labyrinth operation herein referred to should be limited strictly to the purpose of draining the labyrinth. When meningitis has taken place these operations are useless. The object then becomes to drain the point of infection at its seat in the meninges and to drain it over as wide an area as possible, and I believe that the operation which I am about to outline will find a field not only for local involvement and the involvements of serous meningitis, but that it will have a field for diffuse meningitis, even of a purulent character, if the area of meningeal involvement is not too far out of the area of drainage.

The only procedure that we have at the present time to combat meningitis of the type which I am now describing is the Neumann operation, which consists in working down on the posterior border of the petrous portion of the temporal bone, the object being to open into the internal auditory meatus. To my mind this procedure appears to be insufficient;

it does not drain the area as intended, it is extremely difficult to do the operation well, and there is always great danger of fracturing off the petrous bone through the internal auditory meatus forward.

The object of my operation is to drain as wide an area of the meninges as possible. The meninges must be exposed over a large surface; the openings leading into the meninges must be large and the drainage directly out into the radical cavity, where the wound can easily be handled—not through a small opening, but through a large opening directly under the eye.

Technique of the operation—First: Performance of the radical operation.

Second: The radical operation must be carried to its furthest limits; the facial ridge must be cut down to its very last shaving; the middle ear must be curetted till the bone surrounding it is extremely thin; in other words, the middle ear cavity must be enlarged as much as possible. The sinus should be exposed from above the knee, and exposed and followed downward toward the bulb as deep as possible. The bone in front of the sinus must be cut away as deep as possible, exposing the soft parts beyond; the dura outlining the middle cranial fossa above the middle ear should be exposed as deeply and as far forward as possible; in fact, the dura should be exposed over such an area that it will form a junction with the dura covering the sinus region, and the exposure should extend as far forward as the superior semicircular canal. The dura outlining the middle and posterior fossae and covering the sinus should be exposed; the horizontal and external semicircular canals, and, if possible, the superior semicircular canal, should all be brought into view.

Third: The promontory is now opened, and a direct passage is made through it, so that the internal auditory meatus communicates through a direct passage with the middle ear. The modiolus and whole internal ear should be broken down, and this communicating path between the internal auditory meatus and the middle ear should be made as large as possible. When the modiolus is broken down, and the internal auditory meatus opened, there will be an escape of cerebrospinal fluid; the passage must then be packed tightly, as we enter upon the final stage of the operation.

Fourth and final stage: The bridge of the bone now remaining between Trautman's triangle posteriorly, and the middle ear, which holds the facial nerve and the horizontal external and superior semicircular canals, should be broken down and absolutely destroyed; you have now exposed a large area of dura and have converted the anterior and posterior portions of the radical cavity into one large cavity. In other words, the brain is exposed over an area extending from the carotid artery in front to beyond the sinus behind, and the area of dura in the region of the internal auditory meatus has a straight passage for draining to the outside.

It seems to me, regarding this operation, that there would be two points of criticism; the first, the destruction of the facial nerve. This should be offset by the fact when you consider that this operation is indicated only as a last extreme measure to save life where death is practically certain; under the circumstances, the facial nerve should be sacrificed. The other objection might arise that opening of the modiolus causes a loss of cerebrospinal fluid; and that by opening the internal auditory meatus you open a direct pathway for infection to the meninges; but in this connection it must be remembered that the meninges are already infected, and that if infection cannot enter it also cannot escape. The destruction of the promontory and wide opening of the internal auditory meatus make possible drainage of this area of infection. This is a fact that cannot be denied.

Further, in this connection, and as regards the escape of cerebrospinal fluid, I desire to call attention to the work of West & Scott, who describe an operation of drainage of this area by means of a wire drain.

I discovered their work in reviewing the literature concerning this subject. I consider it of greatest importance that this radical labyrinth cavity be finally packed and drained by means of gauze. I mention this because of the fact that when gauze is used the tissues have something substantial around which to build and to demarcate the infection. A large quantity of infectious material is absorbed very quickly by gauze.

DISCUSSION.

DR. G. E. DAVIS said that Dr. Kahn had offered a very good criticism on his own paper in the paper itself,—in regard to the destruction of the facial nerve. For that very reason the operation would seem to be unjustifiable. Again, he had referred to Scott's paper in London in regard to simpler drainage,—where he went through the cochlear and got the same drainage without destruction of the facial nerve. It is difficult to see the necessity for the destruction of the facial nerve, and that constitutes the chief objection to the operation,—since there would result a permanent facial paralysis.

Another criticism would be that it is a very complex operation and one requiring a great deal of skill. However, if you are going to purposely destroy the facial nerve, perhaps that criticism is not so obvious, for, if you go straight through without regard to the facial nerve, there is nothing to avoid.

DR. ALFRED KAHN said that he had pointed out in the paper that the operation was intended only for extreme cases. There is no question that we do not know what to do with these cases. Take the type of case shown, for example; the radical mastoid is performed, followed by labyrinthitis, then meningitis (your patient is unconscious and is dying); the question then arises, have you done everything possible? Will you passively say nothing further can be done; or is there an operation that will give him a possible chance—a small chance, but still a chance. We are at variance. First, there are those otologists who insist that this class of cases be operated at the first sign of meningitis, almost before you could really say there is a meningitis. They argue that operative measures are only successful when the operation is done at this stage. He could not bring himself to agree with this class nor can he justify such a radical procedure at this stage, for the reason that he did not think that we are able to determine what the outcome of the case is likely to be at this time. Certainly some of these cases presenting early symptoms of meningitis never go any further, and make a complete recovery. At this stage a misjudged operation is likely to do more harm than good. Second, there are others who are of the opinion that only those cases showing an extremely high spinal fluid cell count, or even where the specific germ can be found in thespinal fluid, should be operated. Third, then there is a class following the teaching of the Vienna school who are of the opinion that only in those cases of meningitis wherein the labyrinth has become dead, should operative intervention proceed.

It is true that practically all of these cases of meningitis wherein the infectious organism is found in the cerebrospinal fluid, or where a meningitis has occurred following a labyrinthitis—the labyrinth being demonstrated dead,—die. I am of the opinion that none of these factors herein mentioned can be taken as a cardinal basic law, but that each case should be judged on its merits, and each of these factors herein mentioned should be given due consideration.

Having once decided on operative intervention, the operation described seems to have very marked advantages over any other procedure up to date,—and for the reasons mentioned in my paper. This operation is the last resort, the man is dying, the chances are all against him, and you want to do something. This offers a possible procedure. It is not a case of saving the facial nerve, but of getting drainage. The patient's nerve should hardly be taken into consideration; the man's life is the first consideration. Here is an operation where you get directly down to the point of infection.

(1) Otitic Sinus Thrombosis. SEYMOUR OPPENHEIMER, M. D.

B. K., age 18, admitted November 6th to Mt. Sinai Hospital. History—Discharge from left ear for three weeks following an acute head infection. All of the evidences of an acute mastoiditis were present and the patient was promptly subjected to surgical interference. The presence of a slight facial paralysis, as well as a slight paralysis of the external rectus muscle were symptoms present which are not in line with an uncomplicated mastoiditis, but the operative findings did not throw any light explaining their presence. On November 17th, the patient left the hospital with the wound granulating nicely. The subsequent dressings were then carried out, partly by the dispensary staff and by some other physician whom he consulted. The latter advised me on December 3rd that the patient had been running some temperature, ranging as high as 104 for a few days, and with severe frontal headache complained of. A suggestion of a chill had been present. I had the patient returned to the hospital for observation, having of course in mind the possibility of a complicating sinus thrombosis, but as such a complication would be rather unusual four weeks after the primary mastoid operation, there was as well considered, the question of a possible influenza, the pandemic then being so prevalent. The facial and external rectus paresis was still present. For the ensuing five days the patient was kept under close observation; the temperature range was not sufficiently definite to suggest a sinus thrombosis, in fact it seemed to show a receding tendency. Blood culture was negative, as well as Widal and the blood count was within normal limits. Eye grounds normal. The state of euphoria was most striking. A second blood culture taken three days after the first, with the general physical state of the patient improving, was reported as positive. An operation was then undertaken upon the sigmoid sinus. There had been no exposure of the sinus at the time of the primary operation. The dura over the sinus appeared normal until the exposure reached the knee, where it began to show some thickening. Under the usual technique with compression plugs above and below the exposed sinus were incised. The umen contained a well organized thrombus which extended within a very short distance of the torcular, the overlying bone being removed in order to remove the thick external sinus wall, and in order to establish free bleeding from its end. The bulbar end of the sinus was then attacked, but as bleeding did not take place after very mild curetting, the jugular vein was then exposed in the neck and ligated close to the clavicle and above beneath the angle of the jaw as well as its tributory veins, all of which were exsected between the ligatures. The neck portion of the vein contained no thrombosis. There was some slight lymphoid nodular swelling present along the sheath of the vein, but particularly at the junction of the facial vein with the internal jugular. The neck wound was closed with the exception of its lower end. A blood culture taken within a comparatively few hours after the operation was negative. The convalescence was uneventful. The organism recovered from the second blood culture was streptococcus hemolyticus, the same organism being recovered from the thrombus and the exsected wall of the sinus. The extremely interesting features of this case were the late developing of the sinus thrombosis after the original mastoid operation and the improving condition of the patient in the presence of a blood vessel infection of unusual degree, as manifested by the extent of the thrombotic lesion.

(2) Cerebellar Abscess. SEYMOUR OPPENHEIMER, M. D.

C. E., age 25. Admitted to Mt. Sinai Hospital on November 8, 1918, with a history that five weeks previous a growth had been removed from the right ear which was followed by severe pain in the right side of the head with a sharp rise of temperature, dizziness on standing and vomiting on several occasions. Upon admission there was a slight rigidity of the neck, the pupils were equal and reacting to light, marked nystagmus to the right, no Kernig, no Babinski, slight facial peresis, pass pointing normal, very marked adiakokinesis and some mental apathy. The aural

discharge was scant and had been present for many years. Organism, staphylococcus. White blood count 17,000; poly count 77%; temperature 100%; pulse 84; respirations 24. Fundi showed slight blurring of discs, labyrinth functioning normal. For two days the patient was kept under observation. A radiograph showed a well sclerosed mastoid, but no pathological intra cranial findings could be determined. The tentative diagnosis consisted of a chronic mastoiditis with either a localized irritative meningitis or a cerebellar lesion. The pulse rate became reduced to 50 and the lumbar puncture fluid showed an increased cell count to 300 per c. m., but it was bacterially sterile. It was then decided to drain the mastoid which was found to be sclerosed with an obliteration of all cells, the antrum containing a small quantity of pus. The roof of the tympanum was removed and the middle cranial fossa extra durally was inspected but no evidence of an inflammatory process could be determined. The plate of bone over the postero lateral aspect of the cerebellum was then removed and the exposed dura was walled off by packing placed between the dura and the overhanging bone. The patient's ocular condition nor the pulse rate were not in any way modified by the decompression measure. Two days later the dura over the exposed cerebellar area was incised and an abscess cavity was located at the depth of about 1", running apparently parallel to the petrous pyramid. A rubber tissue drain containing a few strands of cat-gut was carefully introduced into the abscess cavity and the patient returned to bed. A superficial dressing of Carrell Dakin solution having been applied. I might add that chloroform anasthesia had been employed, as it was felt that this is preferable in cranial cases as being less liable to induce brain oedema. After this operation the pulse rate of the patient improved, as well as the entire general condition. Five hours after the operation the case was seen by the House Surgeon in making rounds, who found everything satisfactory. A few minutes later, he was hastily summoned to the ward, as the patient had suddenly ceased. Death apparently havinb been due to respiratory paralysis.

My object in presenting this case report for discussion is to again raise that all-important subject, "What is the most efficient method of draining a pus cavity in the brain substance," and to again call attention to the great danger of brain oedema occurring in any case, no matter how slight manipulation had been practiced, or the most moderate degree of trauma induced. Unfortunately no post mortem was procured.

DISCUSSION.

Dr. Alfred Kahn said that in abscess of the brain, particularly abscess of the cerebellum, it has always seemed that the indications for entering the brain abscess have been insufficient. A patient comes in and describes a line of symptoms, and has a slow pulse and a temperature of 100, and the spinal fluid cell count is comparatively high. We have exposed an area of the brain and it looks suspicious; we put in a knife and probe the brain, and no abscess is discovered; or he will tell a story suspicious of brain abscess and we operate and discover a brain abscess. In other words, the discovery of brain abscess is largely problematical. Dr. Kahn said that for his part he would not care to have his brain probed unless the symptoms were very clear, in fact, if he did have an abscess, he would rather take his chances and leave the abscess alone, for he believes that in many of these cases the pus is sterile and they are well walled off by nature. A man may have symptoms and may have headaches, but in the majority of cases he would live much longer if the brain abscess was left alone. There was always a chance that the pus would become absorbed,—a chance that there is sterile pus; pus free from bacteria. Brains of old individuals on autopsy have been found to contain pus cavities, the cavities were well walled off, and these subjects have died from other conditions, having gone to their death unconscious of ever having had a brain abscess.

Dr. Kahn said that he had been experimenting with dogs for a long time, and had done and seen some things in the laboratory that would

have been called impossible, and yet the animals lived. He had injected streptococcus into the brain of dogs, and yet they lived, etc., etc., they lived for weeks. He had seen bacteria injected into the vein of dogs, yet they lived. The tissues of the body will immunize a great many of these infections, just as the body will immunize itself against a general infection. Dr. Kahn said he was aware that this was a radical statement, but from the laboratory standpoint he knows that there is a great deal of truth in it.

DR. GOTTLIEB said he could not quite agree with Dr. Kahn on that particular subject, for he had injected various cocci into the brain of dogs and in 24 hours the dog was dead. They ran a very high temperature in 24 hours, perhaps, and if not drained they died. In his opinion every patient who has pus,—that shows definite symptoms where pus is present,—should be drained. He could not see any other way out of it, even if there are chances that the patient may dei of the operation.

DR. ALFRED KAHN said that at a former meeting of the Section Dr. Gottlieb showed a dog which he had infected and which lived three or four months afterward. He and Dr. Gottlieb had been working in the same laboratory and saw the same autopsies. "Wherever pus is present and shows definite symptoms." That is the point. The fact that a patient has symptoms, has a spinal fluid count,—that does not indicate a brain abscess. You may have a feeling that there is something there and you think you will probe it, and it is 50-50 whether you stick it. You open the abscess cavity; you say you find pus. I claim that it is not always infected, and that if it is sterile pus the patient will be better off if not operated upon. The passage way of a probe or knife is always open to infection, and when a brain is probed in an endeavor to locate an abscess, you minimize your patient's percentage that much.

DR. DANZIGER said he could not agree with Dr. Kahn about leaving brain abscesses alone. Dr. Oppenheimer said that after removing the polyp the patient developed dizziness and other symptoms, and he tested the cerebellum, did not find it working properly, and felt that he was dealing with an abscess. Dr. Danziger said that he felt in such cases the sooner the patient is operated upon the better. If we wait too long, we have to deal not only with an abscess but with a meningitis. He also believed that if a patient has an accumulation of sterile pus and it is carefully opened, no harm will be done. He felt perfectly sure, however, that if one has an acute abscess and it is opened you do the patient a service, and by waiting too long you lessen his chance. In considering abscesses, however, we must differentiate between acute and chronic conditions. The moment you withdraw the knife in the case of acute abscess the cavity disappears. The danger is that by attempting to drain too thoroughly you do more harm than good. Dr. Eagleton of Newark has spoken of that, and said that he attempted to attack brain abscesses without drainage. Drains which are not elastic are liable to do harm at times.

Referring to the case of sinus thrombosis, Dr. Danziger said he had seen an acute mastoiditis that healed within two and a half weeks. Then he developed the typical symptoms of sinus thrombosis after the mastoid wound had healed per primam.

DR. DANZIGER asked if Dr. Oppenheimer always excised the jugular vein. He had found that in almost every one of his cases. Ligature of the vein is sufficient. In cases of thrombosis in the jugular the resection is indicated.

DR. GUTTMAN said that he believed in every case of sinus thrombosis there are one or more not superficial, but deep-seated enlarged lymph-glands. In cases of so-called sensitiveness of the jugular cord, he had his doubts whether this sensitiveness can be ascribed to the swollen glands.

In regard to the case of abscess of the cerebellum, Dr. Oppenheimer was to be congratulated upon his excellent diagnosis based upon such slight symptoms. The man had apparently only nystagmus and some blurring of the optic nerve.

In regard to leaving the abscess alone Dr. Kahn mentions a case where a brain abscess lasted for several years, and was found only after death. That confirms Dr. Kahn's remarks that a man can carry around a brain abscess without having it opened. However, as for leaving a suspected brain abscess alone, Dr. Guttman said he would be more inclined to have it operated upon. There is seldom any bad effect from entering the brain under proper conditions even if there is no abscess found.

DR. MAYBAUM said that an interesting feature of Dr. Oppenheimer was the unusually long interval from the complete healing of the mastoid wound and the onset of the sinus thrombosis without any local signs in the mastoid. This was almost pathognomonic of ear infection caused by the streptococcus mucosus. This type of infection too infrequently gives rise to a mild middle ear inflammation, which may not go on to suppuration, and which soon heals completely only to be followed, after an interval of a few weeks, by an acute mastoiditis or an intracranial complication. It would be interesting to know whether this is the explanation of Dr. Oppenheimer's case, in which the streptococcus haemolyticus was the organism found.

DR. OPPENHEIMER, responding to Dr. Maybaum's request for an explanation of the development of a sinus thrombosis after such a long period in the presence of a streptococcus haemolyticus infection, said, while he recognized that the streptococcus mucosus is of a most insidious type, yet he saw no reason why any streptococcus could not produce a similar condition. It is not unusual to do a mastoid operation on a patient who has had a discharging ear for a month or two and which has gone through the acute stage and simmered down to a chronic state. Upon operation is found the entire plate over the sigmoid sinus gone and that the area was covered with a large amount of granulation tissue, which is nature's barrier. From the bacteriological examinations that had been made he felt satisfied that these cases have not all been streptococcus mucosus infections. He could readily understand how a case of that type might go on and for some reason or another at a later period a sinus infection might take place. With only a layer of granulation tissue as a protective barrier, there is no telling at what moment that may become broken down. Not all of these infections are due to the streptococcus mucosus by any manner of means.

As to jugular ligation, Dr. Oppenheimer said he does not ligate and excise the jugular in every case of sinus thrombosis; but that in every case he resorts to that procedure where he cannot establish a well-developed flow of blood from the bulbar end of the sinus. If after a very moderate amount of manipulation he fails to get free bleeding, he ligates the jugular and exsects it. A simple ligation without excision, as against ligation and excision, has been threshed out in the Academy in this section, and elsewhere, for many a year. The rationale of the procedure of ligation without excision is certainly not based on a sound foundation; surgically, it is all wrong. The advocates of that plan from Boston some years ago presented before the section a series of cases which were ligated without excision and the results were practically the same as in cases of ligation and excision, but from a sound surgical basis it is incorrect to ligate a vessel, leaving in situ the possibility of the collection of thrombotic material which has to drain up hill around the curve of the jugular bulb and find its way into the mastoid cavity. Surgically, that is all wrong, and yet the results have been pretty much the same as the results acquired by other methods.

Last winter he had operated on a child in a very critical condition. Dr. Wendell Phillips, who was present, suggested that the condition of the patient being so bad that simple ligation would probably suffice. Upon being asked if that was sound surgical advice, he replied in the negative, but that it seemed to give about the same results as the other procedure. Dr. Oppenheimer said that he had never been able to make himself believe that that was a correct presumption.

In regard to cases of brain abscess, Dr. Oppenheimer agreed with Dr. Kahn that exploratory surgery of the brain is bad business, and to pick a patient's head full of holes is liable to end disastrously. At the same time, he would not himself feel content, if he knew that a case had a collection of pus in the brain cavity, to rest without some attempt at drainage. We can have no definite assurance of the character of the pus previous to operation,—whether or not it is sterile. Having once established the diagnosis that we are dealing with a brain abscess, it would seem that it ought to be subjected to surgical procedure as soon as possible, but we are compelled at times to do procedures that are not based on absolute focalizing indications. In the case he had referred to there was quite sufficient evidence to establish the main diagnosis of chronic mastoiditis with a meningeal irritation and the possibility of cerebellar abscess. First, there were definite alterations of the pulse rate; the man had definite ataxic symptoms as manifested by the adiakokinesis. There were eye symptoms and evidences of meningeal irritation, and a cell count of 300 per cm. in the spinal fluid. On that basis it was decided to explore first the mastoid and the region in that proximity. Disregarding the fact that he found what he was looking for, Dr. Oppenheimer said that he would have felt very ill at ease in a symptom complex of that nature to have satisfied himself with anything short of exploration.

In general, however, he was in accord with Dr. Kahn's statement that we frequently explore brains without finding what we are looking for. We should always have a definite group of symptoms to guide us in the surgical attack.

One of the serious phases in this whole work is that some of these symptoms that are so significant are comparatively slight and require detailed examination. The significance of a very slight symptom may be very great to a trained observer. Certainly the valuable work that has been developed in the last few years on the muscular relations, etc., requires a highly trained observer to properly estimate the significance of comparatively slight symptoms. Our diagnoses are not all easy. It is very simple to establish a diagnosis when the patient has marked symptoms, which are just prior to a fatality; but to establish a diagnosis in the early stage requires the close attention of a very careful observer who is trained to recognize the importance of comparatively slight symptoms.

January 22, 1919.

Correction of Nasal Deformities by the Implantation of Bone; Improved Technique. DR. W. W. CARTER.

(To be published in a subsequent issue of THE LARYNGOSCOPE.*)*

Adenoids in Infant of Two Months. DR. OTTO GLOGAU.

The patient was an infant two months old who was brought to the office choking, and unable to take nourishment, or to sleep. The Adenoids of the size of a walnut were removed, and this was followed by immediate improvement. Dr. Glogau asked if any of the other members had operated on infants at or near this age. Replying to an inquiry regarding haemorrhage, Dr. Glogau said that there was very little haemorrhage, and described his method of procedure. He had to use the very smallest curette and a forceps in order to remove the remnants.

DISCUSSION.

DR. NORTON L. WILSON said that he had had three or four cases in which the children ranged from three weeks to four months. They all did well after the removal of the adenoids.

DR. SEYMOUR OPPENHEIMER said that while ordinarily no one would approve of operating on a child of this age excepting in cases of necessity,

he had had occasion to operate on one three weeks old who could not take nourishment from the breast. One should not jump to conclusions too rapidly in these cases and think that because a child is a mouth breather it must of necessity have lymphoid tissue in the nasopharynx, for once in a while we meet cases of complete bony occlusion, and that should be considered and a careful examination made to ascertain whether the condition may not be due to bony adhesions in the posterior nares rather than a mass of adenoids causing nasal obstruction.

Nasal Occlusion. DR. OTTO GLOGAU.

The patient was a woman 53 years of age, who came under observation complaining of a stopped up nose. The right nostril was found to be entirely blocked by a mass of cartilaginous structure, and very hard, apparently restricted to the inferior or turbinate. The same kind of growth is now beginning to appear on the left side, at the inferior turbinate.

Pathological report: Small tumor measuring 1 1-2 by 1 cm. composed of thin sheets of cartilaginous material. Specimen received in water.

The section shows branched pieces of hyaline cartilage with perichondrium. The entire specimen is surrounded by an edematous fibrous tissue studded with round cells. The surface is covered with a stratified squamous epithelium showing no horn formation. The cartilage shows a comparatively small number of the characteristic cells in the excess of the matrix. There is also preosteoid tissue present, staining distinctly with eosin.

Diagnosis: Chondroma.

DR. GLOGAU said that the right side alone suggested a malignant growth, were it not for the pathological report and the occurance of the same growth at the left side.

DISCUSSION.

DR. HUBBARD asked if the antra were clear.

DR. GLOGAU replied yes, all the sinuses.

DR. ARROWSMITH said that the fact that it was a bilateral condition without any apparent continuity argued against malignancy

Case. DR. W. W. CARTER.

This patient, a man sixty-three years of age, came into the hospital on October 25. He gives no specific history, and his Wassermann is negative. Ten days previously he had suffered with a great deal of pain in his second molar tooth on the right side and an abscess developed which was incised by a dentist, and a little pus was evacuated; this tooth was then extracted. Immediately afterward (though it may have started before the operation) there was quite a good deal of edema and swelling on the right side of the face and the right eye became closed.

When the patient was admitted, the right eye was closed and that side of the face was red, hot, and edematous, and the man had a temperature of 103.5°. The condition was diagnosed as facial cellulitis and an operation was performed by a general surgeon,—an incision being made through the cheek down to the bone, and another from here (on a lower level) to the bone. No pus was evacuated, however, and there was no record that the antrum was suspected of being the source of the inflammation. That was on October 25th, the day of admission. Fourteen days after the first operation, the patient not being any better and his eye still closed, and the temperature running pretty high, he was again anesthetized and an incision made at this point higher up on the cheek, which reached right down to the bone and was extended along the floor of the orbit. Still no improvement resulted, and on November 22, three weeks after admission to the hospital, Dr. Carter was asked to see the case.

It was at once evident to him that it was an antrum case. An x-ray plate was made, but without waiting for a report from the radiograph, preparations were made for operation. Dr. Carter said he did not see the plate until the next day; but did not think he would have performed both operations at the same time anyhow. The antrum and frontal sinuses were both affected. He went in through the canine fossa and

found quite a good deal of the antral wall to be necrotic. On entering the antrum, the odor was something frightful, and dark greenish masses were found and polypi, showing that the condition was of long standing. Most interesting of all, there was absence of a portion of the bone in the floor of the orbit. There was much bare bone and there was an opening in the floor of the orbit the size of a ten cent piece.

The inferior nasal fossa was opened from one end to the other, and free drainage to the nose established. The swelling immediately went down, and the patient began to get very much better.

As previously mentioned the x-ray plate showed that there was a frontal sinusitis. The patient was again operated upon November 30, and a good portion of the interior wall of this sinus was removed. There were two reasons for not doing the Killian operation; first there was already infection in the orbit and there was danger of starting up general cellulitis of the orbit which would be difficult to control; secondly it was a small sinus. The sinus was found to be full of pus granulation tissue and polypi. The nasal duct was enlarged and drainage into the nose established, a small gauze drain was placed in the inner angle of the external wound for 24 hours. The patient steadily improved, and will leave the hospital in two days.

An important point brought out by this case is that when a great deal of necrotic bone is found in the antrum, no attempt should be made to remove it, for Nature can take care of such a case better than the surgeon. In dressing this case and washing it out, small pieces of necrotic bone came out from time to time.

The patient is now free from pain and anxious to leave the hospital.

DISCUSSION.

DR. ARROWSMITH said that Dr. Carter had made one very important point, namely that one should be very careful not to remove too much in these cases of diseased sinuses, and he himself wished to go on record against too much curetting. The patients do better and the lesions heal more quickly if one is not too particular about denuding the walls of the sinuses. Certainly in this case Dr. Carter's results were very gratifying.

The Importance of Blood Examinations in the Surgery of the Nose and Throat. DR. SEYMOUR OPPENHEIMER and DR. MARK J. GOTTLIEB.

DR. MARK J. GOTTLIEB said that the method they employed in determining the coagulation time was adopted after having tried every other method. The method of removing the blood directly from the vein gives a wrong index as to the actual coagulation time, as Dr. Oppenheimer has stated, when the blood flows over the tissues during an operation it takes up various substances, called thromboplastic substances; whereas when removed directly from the vein these substances are not included and the coagulation time naturally is much longer. That is not satisfactory, although it is scientific. . . . If routine, examinations were made of the bleeding and coagulation time, and the blood platelets counted, we would find more cases of prolonged bleeding time with blood platelets reduced than is generally supposed. It also seems probable that this must occur in families, for we now have records of two families where the parents and children too have prolonged bleeding time and reduction of platelets, in the one instance both the parents and the children being similarly affected; and in the other, one of the parents and the children showing the condition. There is not yet, however, sufficient data to demonstrate whether or not the condition is hereditary; but the subject is worthy of more attention and study than it has yet received.

DISCUSSION.

DR. NORTON L. WILSON commended Dr. Oppenheimer's paper as a timely treatment of a subject upon which there is no agreement at present and which is deserving of a great deal more study than it has yet received. At present it is his own habit to do nothing but take the bleeding time. Some years ago he had done quite a little work on this subject and found as Dr. Oppenheimer had stated, that one could reduce the blood clotting

time by the administration of calcium lactate. For instance in a normal individual who had a bleeding time of seven minutes, it had been reduced to one and one-half minutes. He had tried this on himself, and he knew that normal blood can be reduced by the administration of calcium lactate. He now notes only the average bleeding time, which is about two and a half minutes. Dr. Oppenheimer had said that his patient required five minutes. If it takes five minutes to clot I do not operate.

Dr. Wilson said that while doing this work some five or six years ago, he experimented on over a thousand cases of tuberculosis, and found that in these patients the blood clotting time was brought down in every instance, and that the average time was three and a half minutes. Whether Nature was throwing more calcium into the blood, he could not say. The average time with the instruments (Biffa Brooks) he had been using was seven minutes, so he reached the conclusion that there was something in the blood of the tuberculosis patients which reduced the bleeding time. He had put this problem before the men in the laboratory, but then the war broke out and the work was interrupted.

DR. CARTER asked if Dr. Oppenheimer had made the observation that in continuing the administration of calcium lactate for ten days the blood reached its maximum of coagulability; and that if continued further, the coagulability diminishes. This was first observed by Boynton of London. Since reading Boynton's article some five or six years ago he had always, when giving calcium lactate, continued it for a week or ten days and then let up on the administration; later continuing it for another week or ten days.

DR. WILSON asked if Dr. Oppenheimer had noted any harmful effects from the administration of calcium chlorate. In his own observations he had noted none.

DR. HUBBARD thanked Dr. Oppenheimer for his admirable and timely discussion of the subject. In the hospital with which he himself was connected they had had no real difficulty with haemorrhage for years, though now and then there were cases which were slightly troublesome.

DR. OPPENHEIMER, in closing the discussion, asked Dr. Wilson what the dosage was where he had employed calcium to affect his own blood clotting time.

DR. WILSON replied that it was 60 grains a day.

DR. OPPENHEIMER then said that his observations were not in accordance with those of Dr. Wilson. He had seen many individuals who had had their blood markedly influenced by calcium treatment. Where, however, the blood condition was normal, he had not observed any appreciable effect. Where, however, the bleeding time or the coagulation time was not altered, there had been an appreciable effect.

DR. CARTER was correct in his remarks about the effect of prolonged calcium treatment; it defeats the very object one is trying to attain. It is not advisable to give calcium for more than 4 or 5 days before operating, possibly giving as well one huge dose some 6 hours before operation. To continue calcium feeding over too long a time, defeats the very object in view.

DR. OPPENHEIMER said that he could not refrain from emphasizing his contention that patients are often rushed into operation entirely too rapidly. It is not uncommon for patients to be brought to our offices and operated that same day or the following day. One might feel that to raise all these points as to necessity of preliminary investigation might frighten the patient, but I find in the long run, they approve of careful methods. Only last week he had been compelled to call off three operations as the results of reports on the blood, for operation would probably result in unusual haemorrhage; most of these patients will be operated upon subsequently, and will be all the more grateful for the attention given them. At the present time two children are under observation, who were referred by a physician who wished to arrange for an operation on the following Monday. Dr. Oppenheimer suggested that he would prefer

to examine them carefully first, for he was desirous of ascertaining their blood condition. It was found that both required operation, but that their bleeding and clotting time was over 25 minutes. In one of the children it was also found that the blood platelets, as against a normal of 400,000, were reduced to 75,000. The mother was then investigated and found to have a similar condition. After some discussion and a very careful explanation to the mother so that she might understand exactly what was aimed at, it was requested that the father also come to the office to be examined, for in a similar case the father also had shown a similar tendency, although, in that instance the father had had an old specific infection which might have been the factor responsible. After determining that the father's blood clotting time and the blood platelet count is normal, and that his Wassermann is negative, it is proposed to take his blood serum and to inject the children, and if they show improvement in coagulation and blood time, they will be operated upon.

These cases must be comparatively numerous, for an unusual number have been discovered by us as the result of routine examinations. During the past week a patient was seen with a blood clotting time of 6 minutes and a bleeding time of over 25 minutes. Dr. Oppenheimer said that he did not feel inclined to operate upon such patients.

Probably some one else would perform the operations, and he was quite willing that they should.

Pneumococcus Infection of the Eye, Ear, Nose and Throat.

L. D. Brose, *Southern Med. Jour.*, October, 1918.

The eye, ear, nose and throat are not infrequently attacked by the pneumococcus. Acute rhinitis does not differ in symptomatology from rhinitis due to other organisms. The diagnosis of involvement of the eye, ear, nose and throat rests primarily upon the finding of the pneumococcus by microscopical examination. The tear sac is especially vulnerable to pneumococcus infection. The conjunctiva is frequently inflamed by the pneumococcus and the nose and nasopharynx may become diseased through extension from the conjunctiva. We often see acute otitis media due to pneumococcus infection. Pneumococcus ulcer of the cornea (ulcus serpeus) is met with almost wholly in the adult and in those past middle life. In children, corneal ulceration due to the pneumococcus usually remains superficial and has none of the characteristics of the serpent ulcer. Ethyl hydrocuprein (optochin) is one of the more recent agents asserted to be of almost specific value in the treatment of corneal pneumococcus infection. Ed.

PHILADELPHIA LARYNGOLOGICAL SOCIETY.

Stated Meeting, Feb. 5th, 1919.

COLLEGE OF PHYSICIANS.

Program: Dr. Wm. H. Dearborff: "Case of Edema of the Larynx following Influenza." When seen Dec. 5 last, the young man presented all signs of air hunger. In the family history there were two cousins who died of tuberculosis. He, himself, had pneumonia and diphtheria and was subject to frequent attacks of tonsillitis. He also had an antrum operation. Has had a cough since 8 years of age, lost 40 pounds in the past three months, and three weeks previously had influenza with a slight pulminary cough. Patient complained of pain in the right side of the throat, was aphonic, dyspnea and cyanosis appearing. On Dec. 1st there were stiffness of the neck, tenderness of the left knee and shoulder, swelling of the arytenoids, enema of the glottis. Tracheotomy was performed. Dec. 11th induration of the Epiglottis was noted; Wassermann test was negative; Smears were negative for T. B. as were three successive sputum examinations. Lungs negative, X-Ray of the chest was negative. January 1, 1919, the arytenoids were normal in appearance, cords adducted. Jan. 10 there was motility of the cords with some subglottic edema. Tracheotomy wound practically closed.

Dr. A. Spencer Kaufman: "Report of three cases of Fatal Meningitis due to Unrecognized Ear Disease."

Case 1. A child aged 4, family and personal history negative except for an otitis media at 6 months of age, the affected side not remembered. Of the present illness, the patient was drowsy, with an evening temperature followed by an ear discharge, partly comatose, right eye could not be closed; an exudate on the left tonsil. Lungs and head were negative. Upon spinal puncture there came, under pressure, a clear fluid which reduced Fehling's solution. Upon operation the mastoid cells were filled with pus and edematous fluid escaped which contained micrococcus tetragenus. Patient died 4 days later of pulmonary edema.

Case 2. Female 52, six weeks before had influenza; presented herself with bilateral S. O. M. Examination of the right ear revealed a drooping superior and posterior wall of the canal. Patient was semi-stuporous; there was tenderness over the mastoid; Kernig positive; pneumococci were found in the spinal fluid and the blood count gave 19,800 W. B. C. Simple mastoid with exposure of the dura, which was inflamed. Patient died two days later.

Case 3. Patient, aged 30, seen at the hospital, complained of pain in the right ear following influenza. There was a discharge until 5 days before admission. Patient was depressed and semistuporous 2 days before admission. The spinal fluid was turbid and contained Gram negeative diplococci. The mastoid was filled with a foul liquid pus. Patient died next morning.

Dr. Wm. Penn Vail: "Nose and Throat Work at a Navy Training Camp." Dr. Vail stated that the prime object of their work was to get men in good condition for overseas service. There were men from all parts of the country and he found the men from the South and West quite affected by the change of climate. Tonsillitis being a common

ailment, tonsillectomies therefore, constituted a large percentage of the work. All were done under local anesthesia and he averaged about 25 a month. A certain percentage were done soon after an attack of quinsy with no harmful after effects. The "Snare Method" was used except in 23 cases due to recent inflammation, where blunt dissection was used. In ten cases the operation was a secondary one; 31 were done because of middle ear disease with marked improvement; 17 were done for S. O. M. with distinct improvement. Twelve cases had previous arthritic attacks and were somewhat improved. Two were done on diphtheria carriers, Of the complications: Hemorrhage was the only one and in but three cases was it severe. Two of these were cases of exophthalmic goitre. There were 61 submucous resections of the septum. In one of these was it a secondary operation. Eleven were done for chronic catarrhal otitis media. Of the other work there were 37 peritonsillar abscesses and two pharyngeal abscesses; polyps, spurs, etc.

Dr. W. O. LaMotte of Wilmington, Del. and Dr. Robert F. Ridpath were upon the program but were unable to present their papers.

The Prophylactic Use of Pituitrin in Nose and Throat Operations Under General and Local Anesthesia. SAMUEL SALINGER, *American Journal of Surgery, Anesthesia Supplement,* October, 1918.

A report concerning 48 cases in which pituitrin was given as a prophylactic against hemorrhage and comprises a study not only of the amount of bleeding but also of the effect on the blood pressure and coagulation time. The striking features of the experiments showing the action of the pituitrin were the uniform and prompt rise in blood pressure, the consistent lowering of the coagulation time and the absence of post-operative hemorrhage. Regarding the blood pressure, all the cases with but one exception showed a rise averaging 10 mm. systolic and 60 mm. diastolic, which was manifest fifteen minutes after the injection. This increase was maintained in 60 per cent. of the cases for as long as 18 hours. There was a definite decrease in coagulation time of from ½ to 5 minutes. The slowest coagulation time, in one case which took nine minutes, was reduced to four minutes. There was only one case in which the coagulation time was not affected. The amount of blood lost at the time of operation was none or slight in 74 per cent. and moderate in 26 per cent. of all the cases. There was only one case in which post-operative bleeding was noted (8 hours after operation). ED.